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ULCERS NEW AND OLD: JEJUNAL FOR DUODENAL ULCERS.

Delivered at the Royal College of Surgeons of England on Feb. 4th, 1916,

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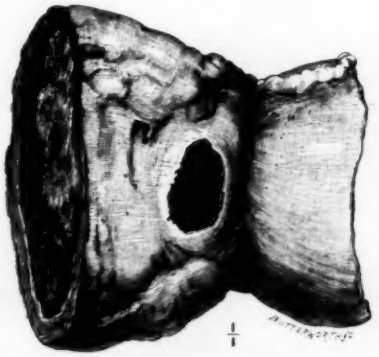
MR. PRESIDENT AND GENTLEMEN,—About 50 years ago the chronic duodenal ulcer was recognised as a clinical entity, and its treatment remained for many years in the province of the physician. Operations were performed for the relief of duodenal ulceration by Codivilla (1893), Dean (1894), and Dunn (1895). In the first decade of the present century W. J. Mayo, Mayo Robson, Moynihan, Paterson, Sherren, and others opened up a new field of surgical enterprise.

We know that chronic ulcer of the duodenum is a common lesion. For some undiscovered reason the ulcer in the majority of instances is situated within 2 cm. of the pylorus, and as a rule on the anterior wall of the duodenum, midway between its upper and lower borders. A chronic ulcer in this position is rarely accompanied by physical signs, but it sets up symptoms so easily recognised that there is no reason for resorting to the ways of Zadig in order to read them. The duodenal ulcer often appears as a rounded depression in the mucous membrane with the muscular coat as its floor. In many a layer of thickened peritoneum forms the base of the ulcer;

FIG. 1.

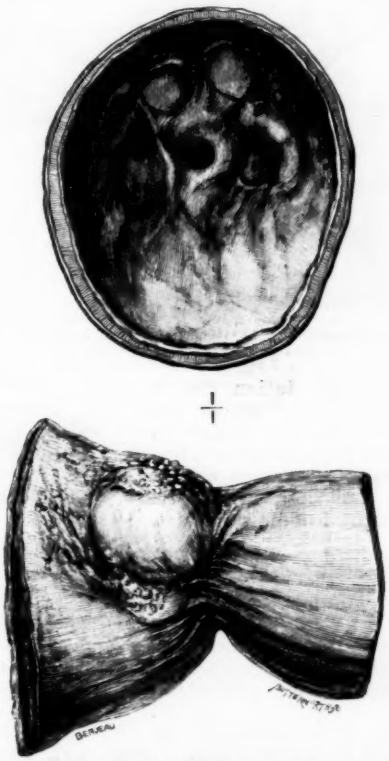


Dice-box-shaped segment of the parts adjacent to the pylorus. The duodenal bulb contains a chronic ulcer. The parts were excised from a spinster, aged 55, who had been a dyspeptic for 30 years.

occasionally it rests on the pancreas, the liver, or the gall-bladder. An ulcer on the anterior wall of the duodenum may rest on the peritoneum covering the anterior abdominal wall. (Fig. 1.) There is a serpiginous ulcer that persists for years, creeping round the duodenum, scarring at one edge and so deeply eroding at the other that the tissues forming its base are often diaphanous. The peritoneal surface of the duodenal bulb in such a case is often white with scars. (Fig. 2.) Obstruction of the pylorus frequently complicates ulcers near the pylorus; it is caused by œdema of the mucosæ. This condition also occurs with an ulcer situated in the pyloric antrum. (Figs. 3 and 4.)

Some of the most troublesome ulcers in the pyloric region can neither be seen nor felt in the course of a gastro-jejunostomy. A small duodenal ulcer can only be detected when it involves the peritoneum and produces a tell-tale scar. These small ulcers cause paroxysmal pain and digestive discomfort, the symptoms of "a vext duodenum

FIG. 2.



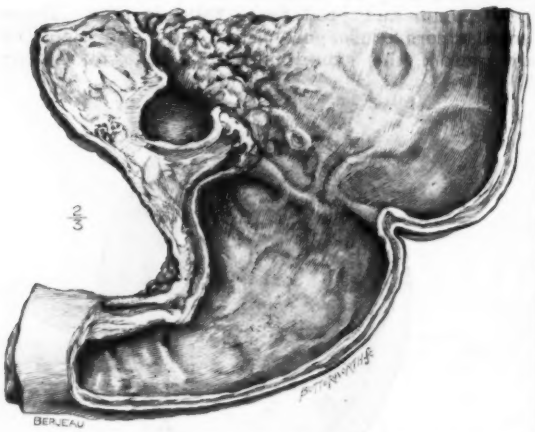
A gastro-duodenal cylinder. There is a white scar on the anterior surface of the duodenal bulb. The interior of the bulb is shown in the upper figure; it contains an active ulcer, and transparent patches indicate the scars of old ulceration. Excised from a woman aged 45.

and an agitated pylorus." This neat epigram (unearthed by Moynihan) was framed nearly a hundred years ago by Sydney Smith, the brilliant writer and preacher, who studied medicine in Edinburgh, and later in life doctored his parishioners as a rural amusement.

The chronic ulcer of the duodenum is exceptional in another feature. In all regions of the body open to observation a chronic ulcer is liable to become cancerous, especially between the thirtieth and fiftieth years; this is the age-incidence of duodenal ulcer. We know that chronic ulcers of the leg, lupus patches, and gastric ulcers occasionally become cancerous, but this change in duodenal ulcers has never been proved, although they are some of the most chronic occurring in man. I have long sought among the living, the dead, and in museums for a duodenal ulcer that has become cancerous; so far my search has been unavailing. Cancer arises in the duodenum, but not in the region that is the usual seat of ulceration. The frequency with which gastric ulcers become cancerous and the infrequency of cancerous change

in duodenal ulcers are difficult of explanation. When cancer exists in the stomach small fragments detached by the churning movements are transported with the chyme into the small intestine,

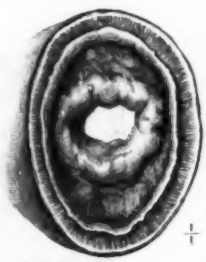
FIG. 3.



Pyloric segment of the stomach with a callous ulcer. Excised from a dyspeptic man aged 48.

but an implantation cancer in the intestine above the ileo-cæcal valve is unknown. Shattock suggests that shed fragments of gastric cancer would not escape tryptic digestion. I agree with him.

FIG. 4.



Pyloric orifice of the preceding specimen from the duodenal aspect. It shows œdema of the mucosa.

JEJUNAL ULCER (PEPTIC ULCER).

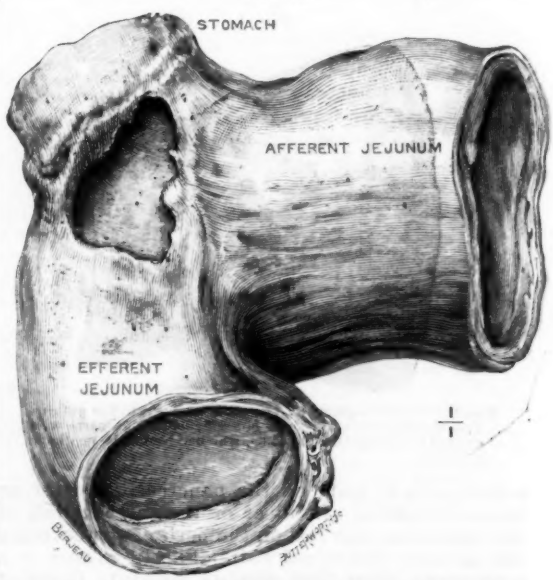
The jejunal ulcer that follows gastro-jejunostomy is often called a peptic ulcer, a term implying faith in the opinion that it is produced by the action of gastric juice. This ulcer was described by Braun in 1899. It resembles the common ulcers of the stomach and duodenum and has sharp edges, often so sharp as to look as if it has been punched out. It is a dangerous ulcer and occasionally perforates before protective adhesions have formed, and causes septic peritonitis that often has a fatal ending. Some peptic ulcers have thickened edges and run a chronic course.

A peptic (jejunal) ulcer causes pain in the epigastrium aggravated by the ingestion of food. The symptoms often resemble so closely those associated with a duodenal ulcer as to lead patients to complain that the pain and discomfort, for which gastro-jejunostomy was performed, have returned. When a jejunal ulcer follows anterior gastro-jejunostomy there is often an area of tenderness and sometimes a definite swelling under the upper part of the left rectus muscle. This indicates that the ulcer involves the peritoneum on the anterior abdominal wall. I have had two opportunities of studying the changes in the jejunum that precede the formation of a jejunal ulcer and I am able to exhibit one of the specimens.

In March, 1906, I performed anterior gastro-jejunostomy on a man, aged 44, for symptoms indicating the existence of a chronic duodenal ulcer. The operation relieved the man of his pain, and he remained in good health for nearly seven years. Then the pain returned with great severity, and on the urgent representation of his medical attendant the patient was re-admitted, December, 1914, into the Middlesex Hospital. He complained of pain following the ingestion of food, and there were a tender area and slight swelling under the upper part of the left rectus muscle near the costal margin. I had no doubt that the man had an ulcer in the immediate vicinity of the new stoma. With the help of X rays and an opaque meal the material could be seen escaping, partly through the pylorus and partly through the new stoma. On opening the abdomen the white scar of the original ulcer in the duodenum was visible. The area of the stomach involved in the gastro-jejunal junction adhered to the anterior abdominal wall, and on detaching it an irregular opening appeared in the efferent limb near the gastro-jejunal junction. (Fig. 5.) The segment of stomach and the cylinder of jejunum involved in the junction were cut away. The opening in the stomach was closed with silk sutures and the cut ends of the jejunum were joined end to end. The man recovered easily and quickly. The changes that have taken place in the tissues of the jejunum adjacent to the new stoma are remarkable. Normally the mucous membrane of the jejunum is thick and thrown into folds, the familiar valvulæ conniventes (Fig. 6); but in this specimen the jejunal mucous membrane in the vicinity of the new stoma is thin, the valvulæ are effaced (Fig. 7), and the muscular coat is thin and transparent. The hole occupies the efferent limb of the jejunum just beyond the cicatrix marking the union of the stomach and gut.

A consideration of the structural alterations of the jejunum in the neighbourhood of the new stoma resulting from gastro-jejunostomy leads to some conjectures of high interest. There are no valvulæ

FIG. 5.

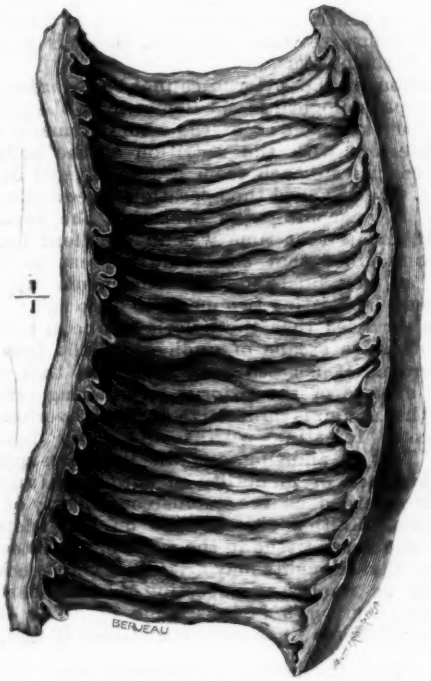


The limb of jejunum concerned in an anterior gastro-jejunostomy. A peptic ulcer is seen in the efferent limb.

conniventes in the first 4 or 5 cm. of the duodenum, and its wall is thinner than in the remaining portion; it is often dilated and forms the bulbus duodeni. A remarkable transformation occurs in the jejunum when the escape of chyme from the stomach is

transferred, in consequence of gastro-jejunostomy, directly into the jejunum. The wall of the jejunum receiving the impact of chyme ejected through the new stoma becomes attenuated, the valvulæ disappear, and the jejunal walls assume the peculiarities of the supra-ampullary segment of the duodenum. This change entails a liability to

FIG. 6.



Portion of the jejunum laid open to show the valvulæ conniventes.

ulceration so common in duodenum. Thus surgery, by changing the environment of a segment of the jejunum, has evolved during this generation a new variety of ulcer. The time required to induce a segment of the jejunum to assume the characters of the supra-ampullary portion of the duodenum will probably be determined by subsequent observations.

It is the common opinion that the duodenal ulcer is caused by the impinging of acid chyme ejected through the pylorus on to the wall of the duodenum. The features surrounding the origin of a jejunal ulcer following gastro-jejunostomy seem to support the percussion theory, but so far discussions on the mode of origin of gastric and duodenal ulcers pay but little regard to the influence of bacterial action. Most of us believe the stomach to be amicrobic as long as it can expel its contents, but observations on the fluid found in the abdominal cavity of patients with perforated gastric and duodenal ulcers prove that it often swarms with pathogenic micro-organisms, especially streptococci. These are introduced with food, and especially milk, wittily described as "our most polluted article of diet."

It is noteworthy that a jejunal ulcer is rarely seen as a sequel to gastro-jejunostomy performed for the relief of cancer of the stomach. This may be explained on the ground that such patients rarely survive the operation long enough to permit a jejunal ulcer to form. It is established that a "peptic jejunal ulcer" may make its appearance six months after a gastro-jejunostomy, or be delayed ten years.

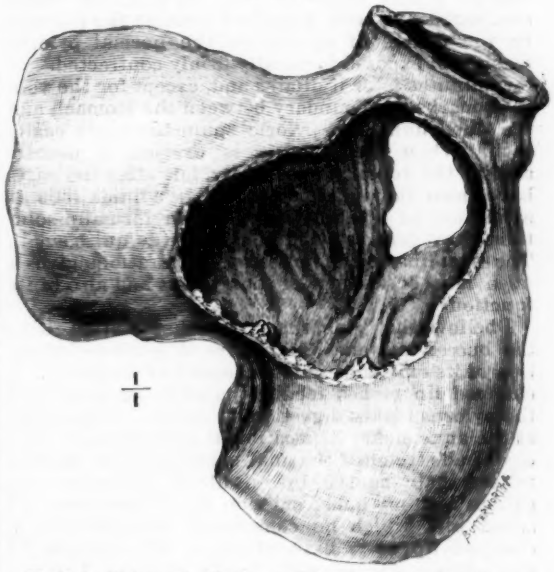
Some surgeons attribute these secondary ulcers to faults of technique, or a method of suture different from that employed by the surgeon who criticises the report; or the suture fails to completely control the bleeding from the cut edges of the gastric or the jejunal mucous membrane and an hæmatoma forms. There is very little evidence available for the incrimination of silk or linen threads; persistent sutures have rarely been found associated with secondary jejunal ulcers.

INDIRECT OPERATIONS ON THE VISCERA.

Few things are more remarkable in the history of surgery during the last quarter of the nineteenth century than the origin and development of operations on the viscera. This advance was the outcome of two discoveries—anæsthesia and antisepsis. Surgical boldness and dexterity have always been available, but after the discovery of anæsthesia surgical rashness knew no bounds, but sepsis curbed it. Since the detection of the cause of sepsis and the discovery of means for preventing it surgical enterprise has been safeguarded.

In dealing with the viscera surgeons advanced tentatively. The effects of the removal of a particular viscus, or even a portion of it, on the physical efficiency of the individual were unknown. The internal reproductive organs of women were regarded with almost fetish reverence. Instead of removing the uterus when occupied by fibroids, surgeons removed the ovaries, with the hope of establishing an artificial menopause and inducing the fibroids to shrink. Gradually men realised that

FIG. 7.



The limb of jejunum in Fig. 5 opened from behind to show the almost complete effacement of the valvulæ conniventes.

the ovaries are the dominant organs of sexual life. So with the prostate. Ignorant that a big prostate could be enucleated, surgeons, actuated by false ideas as to the effects which followed removal of the ovaries, excised the testicles or divided the vasa deferentia, with the hope of causing the prostate to atrophy.

In the case of the intestinal tract, surgeons were content to make an artificial anus in order to relieve obstruction caused by cancer of the colon or of the anus. In 1881 Bryant, in the course of making an

artificial anus, stumbled on a cancerous constriction, and the operation ended as an impromptu colectomy. Since that event resection of the bowel and short-circuiting have reduced colostomy to the position of an operation of despair!

The class of operations just considered may be called indirect operations; they may relieve the patient, but do not remove the disease. To this class gastro-jejunostomy for the relief of duodenal ulcer may be added. It is admitted that the most favourable conditions for gastro-jejunostomy are a pylorus blocked by an inflammatory mass, and a stomach with muscular tissue sufficiently vigorous to propel the chyme through the new stoma. A dilated stomach with an unobstructed pylorus is so unfavourable for gastro-jejunostomy that surgeons are at their wits' end to devise means for closing the pylorus, not only to compel the chyme to take the new route, but also to hinder an efflux of bile through it into the stomach. With an unobstructed pylorus gastro-jejunostomy cannot be relied on to cure a chronic duodenal ulcer, and as it exposes patients to the discomforts and risks of regurgitant vomiting and jejunal ulcers I have gradually abandoned it as a routine method, and prefer to excise the pylorus and the segment of duodenum containing the ulcer.

THE PYLORUS.

It is difficult to describe with certainty the functions of the pylorus. That it delays the efflux of chyme cannot be denied, but the rapidity with which a foreign body is discharged from the stomach into the intestine indicates that its controlling influence is by no means great, Smooth foreign bodies under an inch in diameter when swallowed are soon propelled through the pylorus. In the course of operations the normal pylorus when first exposed is usually firmly contracted. A few minutes later it dilates and, except for the vein that marks the boundary between the stomach and the duodenum, the pyloric sphincter is not easily seen. When the pylorus is excised it usually admits the index finger easily, but after the parts have been immersed in preservative fluids such as a mixture of alcohol and water, or formalin solution, they contract and the orifice is quite small. The examination of museum preparations gives a false idea of the size of the pylorus and also of its function.

I believe the pylorus is extremely sensitive. Like the buccal and anal sphincters, it gives no indication of its existence unless chapped or ulcerated. A chapped lip makes feeding painful; an ulcer near the pylorus makes digestion an ordeal; and an ulcer at the anus makes defæcation a daily terror! One day I had stretched the anal sphincter of a man to relieve pain caused by an ulcer. Crossing the garden with my house surgeon shortly afterwards I asked him which he considered more painful, a chapped lip or a fissured anus. He replied, "I don't know, for at the present moment I've got both!"

Duodenal ulcers may be mere dimples in the mucous membrane, others (miscalled fissures), deeply eroded pits, or narrow ulcers extending through the mucosa to the muscular tissue. It is conceivable that when irritated by the passage of acid chyme a spasm is set up producing painful sensations.

The common form of dilated stomach, nicknamed splashy stomach, and which was mainly responsible for bringing routine gastro-jejunostomy into disrepute, is worth some attention; I believe it is caused in some cases by spasmodic closure of the pylorus. Just as the small painful ulcer or fissure of the anus leads to irritative action of the anal sphincter, often ending in dilatation of the rectum and the pelvic colon, so repeated spasmodic contraction of the pyloric sphincter will produce dilatation of the stomach. Convinced of this correlation of events, I have excised the pylorus in such cases with good consequences, but on the whole the conditions which give the best results to this mode of treatment are those in which there is a gross lesion at the pylorus.

Excision of the pylorus cannot be regarded as a serious physiological loss. Removal of the pyloric half of the stomach or of the whole stomach does not interfere with the nutrition of the body. I removed the stomach from a woman, aged 35, for cancer. She survived the operation three and a half years. A year after the operation she reported herself, and at that time was in excellent health. She complained that she could not eat so big a meal as her husband, but she made up the difference by "eating two meals to his one."

It is surmised that the pyloric sphincter hinders the premature escape of undigested food into the duodenum. It has also been suggested that spasmodic closure of the pylorus, originating reflexly from the ileum, is protective against overloading the small intestine with insufficiently digested food. This is amusing, for the idea presupposes the existence of mentality in bowels, a function usually regarded as the exclusive property of the cerebrum. Keith's observations on the islets of ganglionic nerve-tissue in the walls of the intestine suggest that thoughts may arise in a man's bowels as well as impulses suggesting ideas. Perhaps Menenius Agrippa's famous fable of "The Belly and the Members" has some foundation in fact.

THE TECHNIQUE OF PYLORECTOMY.

When the conditions are favourable, excision of the pylorus, to surgeons accustomed to intestinal operations, is a simple matter. Favourable conditions mean a narrow and elongated pyloric segment of the stomach and the absence of adhesions between the pylorus and the liver, or the pancreas, or the transverse colon. The disparity in thickness of the gastric and duodenal walls is embarrassing to the operator, but with practice the difficulty disappears. Extensive adhesions to the pancreas or to the liver are a bar to pylorectomy. The supra-ampullary segment of the duodenum is occasionally much shorter than usual, and makes the suture of the cut end of the stomach to the duodenum a difficult proceeding.

In the method I employ the abdomen is opened by a median supra-umbilical incision. The parts in the neighbourhood of the pylorus are examined in order to verify the diagnosis. The condition of the stomach is investigated, as well as that of the gall-bladder. When the conditions are favourable for pylorectomy the vessels are clamped and stripped from the pyloric region of the stomach, the loose tissue between the supra-ampullary portion of the duodenum and the pancreas carefully detached, and all bleeding vessels secured with forceps. When the pylorus is sufficiently freed from its attachments a clamp is applied to the stomach, about 5 cm. from the pylorus, the duodenum is clamped beyond the situation of the ulcer, and the pylorus excised. This is the best stage of the operation in which to ligature the vessels, as they are well exposed and easily accessible.

The cut edges of the duodenum and stomach are sutured in the manner of an end-to-end anastomosis. I always use thin sterilised silk for this purpose and for ligatures. It is tedious and unnecessary to describe in detail the methods available for sewing the cut end of the duodenum to the hole in the stomach. It is like stitching a sleeve in a shirt; the clever sempstress varies her methods according to the material and the size of the garment. So with the surgeon. In a case of extensive resection (Fig. 3) the line of suture in the stomach was 6 inches across. Not wishing to imperil the safety of such a long line of suturing by joining the duodenum to it, I implanted the cut margins of the duodenum into a fresh opening in the posterior wall of the stomach. In spite of the careful ligature of vessels there is usually some post-operative oozing from the tissues in the wound area, and it is wise to drain for 48 hours. The abdominal wound is closed with through-and-through sutures, the fascia being brought into apposition with intermediate sutures of thin silk.

The first patient I submitted to pylorectomy for duodenal ulcer was a woman, aged 35, at the Middlesex Hospital in 1909. Gastro-jejunostomy had been performed three months previously, but the pain remained unrelieved. I excised the pylorus and the segment of the duodenum containing the ulcer. She made a quick and uneventful recovery. I have since lost sight of this patient. A few days later, when operating on a man for a duodenal ulcer, I found the conditions so favourable for pylorectomy that I excised the pylorus and the bulbus duodeni with the ulcer. Six years later I re-examined him with the help of X rays and an opaque meal, and found the gastric efflux satisfactory.

I have excised the pylorus for chronic duodenal ulcer according to the method described in 20 patients. In three of them I had previously performed gastro-jejunostomy. In one the symptoms returned three months after the gastro-jejunostomy, in another six years, and in a third two years. One patient, the sixteenth in the series, died. He was a man aged 38, transferred from Dr. Essex Wynter's ward to mine with typical symptoms of chronic duodenal ulcer. At the operation an ulcer was found close to the pylorus on the anterior wall of a well-marked bulbus duodeni. I departed from my usual method and sewed the cut edges of the mucous membrane with catgut. The man made good progress until the fifth day, when his temperature rose to 103° F.; he died on the nineteenth day after the operation. The suture line had sloughed in two spots. I attribute this unfavourable result to the use of catgut.

SUMMARY.

Since the treatment of duodenal ulcer passed into the province of surgery it has become the routine practice to perform gastro-jejunostomy for its relief in the hope that by diverting the chyme through the new stoma into the jejunum the ulcer will heal. If the pylorus is obstructed by the ulcer the results are usually good, because the chyme must pass through the new stoma; but when the pylorus is patent the chyme flows through it and in some instances ignores the new route. The efflux can be watched with the help of an opaque meal and X rays. I believe it is better whenever practicable to excise the pylorus with the ulcerated portion of the duodenum and rejoin the stomach and duodenum on the principle of an end-to-end anastomosis. If this method could be made safe gastro-jejunostomy for the relief of chronic duodenal ulcer with an *unobstructed* pylorus would soon be abandoned.

Experience proves that posterior gastro-jejunostomy with an *obstructed* pylorus is a beneficent operation, in spite of the risk the patient runs of getting a new ulcer for an old one. The new ulcer has been evolved in this generation by alterations in the environment of the jejunum brought about by surgery.

TRENCH NEPHRITIS.[1]

BY W. LANGDON BROWN, M.D. CANTAB., F.R.C.P. LOND.,

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IN May last the Medical Research Committee, at the request of the Director-General of the Army Medical Services, made arrangements for a number of cases of trench nephritis to be investigated in wards under my care at the St. Bartholomew's Hospital Section of the 1st London (City of London) General Hospital. More than 100 cases have been under my care, but of these only 58 were specially investigated.

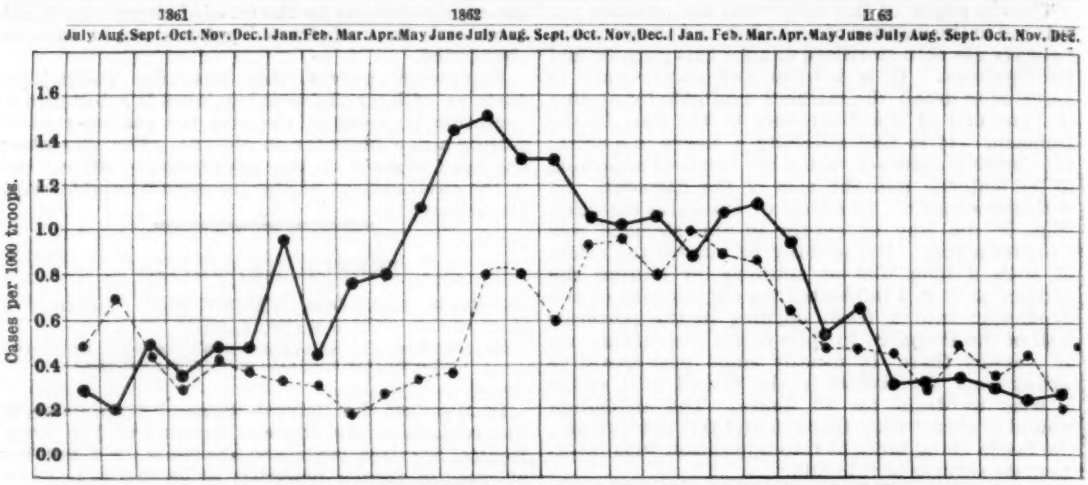
It is difficult to choose a name for the condition which shall not beg the question of its origin. "Epidemic nephritis" assumes what I am trying to prove. "Trench nephritis" is not strictly accurate, since I have had cases among orderlies from base hospitals, and others who have not been in the trenches. Still, the condition cannot be said to be prevalent outside the trenches, so the name will serve.

Acute nephritis is not a common disease in civil practice; it is not possible to give exact figures, since it is not a notifiable disease, but Sir Wilmot Herringham found that at St. Bartholomew's Hospital, with an average number of 7000 medical admissions a year, only 166 cases of acute nephritis, 120 being males, were admitted during nine years. I found that in a period of five years only 26 cases occurred here in men of military age.

Now whereas typhoid and dysentery have in the past dogged most campaigns, acute nephritis, as a rule, has not. I have not been able to find that it was prevalent in the Franco-Prussian War, the Chino-Japanese War, the Soudan War, the Hispano-American War, or the Russo-Japanese War. It was certainly rare in the South African War. Thus, the late Dr. Washbourn reported that "acute nephritis was singularly infrequent." At Deelfontein there were only 6 cases of acute nephritis. Dr. Tooth reported that at the Portland Hospital they only saw 3 cases, and in these the kidney lesion was almost certainly not acquired during the campaign. Personally, I did not see a single case in South Africa.

On the other hand, there was a very considerable outbreak of the disease in the American Civil War. I have drawn up a curve (see figure) by adding together the cases classified as general dropsy, Bright's disease, and inflammation of the kidney. This is necessary, as the diagnosis of Bright's disease, which was not made till September, 1862, gradually replaced that of general dropsy, which was discontinued in December, 1863. The curve will therefore include cases of chronic nephritis, but this would not affect the extraordinary rise which

[1] Being an introduction to a discussion held by the Medical and Therapeutical Sections of the Royal Society of Medicine on Feb. 15th.



Curve showing incidence of nephritis per 1000 troops during first part of American Civil War among the Northern Armies. The armies of the Central Region were attacked earlier and more severely by the disease. Black continuous line = central region. Dotted line = rest of army.

took place between March, 1862, and March, 1863. The case-incidence per 1000 troops rose earlier in the armies of the Central Region and reached a higher level than that for the rest of the army. In subsequent years there was no similar rise, but a small secondary one during the warmer months of 1864. In the Central Region the incidence reached 1·5 per 1000. Throughout the war there were 14,187 cases (see table). It is of great interest to recall that in the American Civil War the military conditions resembled those of the present war in some important particulars. There was the sudden dash of the Confederates northwards, which was checked and followed by prolonged trench warfare.

Cases of Nephritis in American Civil War in Northern Armies.

Periods.	Average strength.	Cases.	Deaths.
May–June, 1861	42,500 ...	27 ...	0
July–June, 1861–62	279,000 ...	1,790 ...	45
,, ,, 1862–63	614,000 ...	6,603 ...	148
,, ,, 1863–64	619,700 ...	2,677 ...	81
,, ,, 1864–65	574,000 ...	2,744 ...	77
,, ,, 1865–66	101,800 ...	346 ...	9
Totals	— ...	14,187 ...	360

The present epidemic in the British Expeditionary Force is not assuming such dimensions as these. Up to the end of June, 1915, 1062 cases had occurred. Very few were reported until February, in which month 72 cases occurred, 138 in March, 220 in April, 211 in May, and 326 in June. Since then the monthly returns have shown a steady increase. It is interesting to note from the discussion on the subject in Vienna that there has also been an outbreak among the German and Austrian troops, and that it began about the same time as in our army.

Etiology.

It is a hallowed tradition in medicine that exposure is a very important cause of nephritis. Yet we notice that while the troops were enduring much cold and exposure during the bad winter of 1914–15 there were but few cases of nephritis then. It was not until the weather was better that the disease assumed epidemic proportions. But so ingrained is the tradition that attempts were made to show that although continued cold was not responsible the violent fluctuations of temperature in the early spring played an important part. I imagine that theory died a natural death as the summer came on and the number of cases increased. Still as I am not sure that exposure has been given up as the cause, I will add the following arguments.

When I was in Bloemfontein during the South African War I saw the mirage between 2 and 4 P.M., while by 6.30 the ground was covered with hoar-frost. There could hardly have been such a violent fluctuation of temperature as this in Flanders; yet, as I have already said, nephritis was rare in the South African War. In the Russo-Japanese War during the month of February, 1905, the thermometer showed great differences between the minimum and maximum readings, such as from 14° to 83° F. and from 26° to 75°. Yet I do not read that there was an outbreak of nephritis. Again, look at the incidence in the American Civil War. How can a climatic cause account for an outbreak which started in March and lasted for a whole year, but which was not repeated in the subsequent years of the war? However, I made careful inquiry as to exposure in the 58 cases which were the subject of special investigation; in 20 cases the men were sure they had been specially wet before the illness began, whereas in 38 cases no such history could be obtained. I doubt very much if mere exposure damages healthy kidneys. On the other hand, I do think that exposure will exacerbate chronic nephritis, and I have seen a return of the albuminuria in some of these cases when apparently convalescent if the patient got cold. Probably the theory of nephritis starting from cold obtained currency in some such way. The trend of modern research has been to discredit climate as a cause of epidemic disease, though past beliefs are enshrined in such names as malaria and influenza.

Many other causes have been suggested; of these the question of the water-supply demands consideration first. There is the possibility of the water having been derived from an unwholesome source, or that chlorination affected the water, or some metallic poison might have been derived from the galvanised water-carts or the water-bottles. My cases lend no support to any of these hypotheses; the sources from which the patients had obtained water were extremely variable. Moreover, some had been careful about boiling the water, others had not; in some cases the water had been chlorinated, in others it had not.

Excessive protein diet has been suggested as a possible cause. It seems highly improbable that 180 grammes of protein would cause acute nephritis in a number of otherwise healthy men. If it did, it could only be through setting up an intestinal toxæmia. Mr. Mackenzie Wallis's observations are definitely against the presence of an intestinal toxæmia, since he found neither an increase in the ethereal sulphates nor the presence of urobilin in the urine.

Acidosis has also been suggested as a cause on account of the frequency with which dyspnœa occurred in the early stages of the disease. It is not clear how acidosis could arise on the diet given to the troops, nor is there a general agreement that acidosis can cause nephritis. Acidosis was not a constant feature of the cases with dyspnœa in which we investigated the CO_2 content of the alveolar air.

In the discussion held at Vienna on this outbreak various other causes were suggested, even including the deliberate taking of cantharides or chromic acid by soldiers in order to render themselves unfit for further service. The combination of alcoholism and exposure was also suggested. However plausible alcoholism might be as a cause in German troops, it would not explain the outbreak in ours. Dysentery and typhoid were suggested as causes, but other speakers called attention to a lack of agreement between the curves of incidence of the intestinal and the kidney conditions. Moreover, dysentery and typhoid were rife in South Africa, yet nephritis was rare. Some speakers regarded the condition as an exacerbation of chronic nephritis, but this would only apply to a few cases. Thus in my series there was a previous history of nephritis in only five. Moreover, there is no reason to suppose that there are a larger proportion of men with damaged kidneys engaged in this war than in other wars. Antityphoid inoculation has also been held responsible, but there is no evidence that the injection of immune bodies can excite nephritis, nor is this consistent with the rarity of the disease in South Africa and among the inoculated troops training at home.

The French army surgeons report that there have been a certain number of instances where the disease was simulated by putting white of egg into the urine and injecting water under the skin. They have also suggested that the disease was due to a suppressed form of scarlet fever. It is interesting to note that very few, if any, cases have occurred among the Indian troops, and the natives of India are said to enjoy comparative immunity from scarlet fever. It is also interesting to note that otitis media, so common in scarlet fever, developed just before the œdema in two of my cases. Sore-throat was also not uncommon at the outset; 17 of my 58 cases complained of this. Mr. Mackenzie Wallis has made a comparative study of trench nephritis and scarlatinal nephritis, and has shown many points of similarity, both in the lesions produced and in the characters of the urine. But we do not believe that the two are identical. If the same percentage of nephritis occurred in this presumed suppressed scarlet fever as in the ordinary type this would mean that there had been about 10,000 cases of suppressed scarlet fever among the troops, which appears to me an impossible assumption. Moreover, even in "scarlatina *sine eruptione*" desquamation follows, which has not been observed in these cases.

A point which deserves consideration is the comparative rarity of the disease among officers.

The rapid increase in the number of cases in this war and in the American Civil War, starting about March in each case, and the close similarity between the individual cases suggest some common cause and one not operative in all wars. The simplest explanation would be a specific infection. In attempting to elucidate this, our first step was to try by chemical tests whether the nephritis was of the infective or toxic type. Some authorities claim that the infective type is glomerulo-tubular in distribution, while a toxic nephritis, such as that produced by corrosive sublimate, is mainly tubular. I may say I am rather sceptical as to the value of this distinction, but so far as it is valid our results would point to the involvement of both glomeruli and tubules. I do not propose to go into details, but I may say that the tests we employed were the chloride test, the iodide test, the lactose test, and the diastase test. Mr. J. W. Trevan carried out the first three and was able to show that both glomeruli and tubules were involved, and Mr. Mackenzie Wallis found by the diastase test not only that there was tubular damage, but that the degree of that damage could be estimated in this way, and that the test was thus a valuable aid in prognosis. The cases that have a low diastase output after the cessation of albuminuria cannot be regarded as completely recovered and are liable to relapse.

Morbid Anatomy.

The morbid anatomy of the kidney in a few fatal cases was found by Professor F. W. Andrewes to show signs of a subacute diffuse nephritis. All the glomeruli showed evidence of inflammation, and there was extensive damage to the convoluted tubules. The interstitial tissue of the kidney was œdematous and infiltrated with lymphocytes and polymorphs. There was no fibrosis and no micro-organisms could be found. Pyelitis was not found.

Pathology.

As there was thus complete evidence of glomerulo-tubular changes an infective process was indicated. Blood cultures were, however, sterile. There remained the possibility of a local infection from which toxic products were disseminated. Attention was naturally first turned to the urine. Catheter specimens were obtained in 21 consecutive cases and cultures made. In 18 of these the urine proved to be sterile. From the 3 remaining cases B. coli were obtained, but in two of them only with difficulty. I mention this specially as Klein and Pulay in Vienna and MacWalter in Ireland lay stress on B. coli as the causal agent. Our cultural and histological results are definitely against this conclusion.

Throat cultures.—Of the cases 17 complained of a sore-throat as an early or initial symptom. Tonsillitis is known to be associated with nephritis, so cultures were made from all the throats where soreness was complained of, and in several where no such complaint had been made. In every instance streptococci grew in abundance, sometimes practically in pure culture. Pneumococci were found in 5, and diphtheroids and micrococcus catarrhalis were also found in some cases. Before it could be concluded that the streptococci were responsible in any way, it was necessary that controls should be made, since streptococci are normal inhabitants of the throat. Dr. R. G. Canti therefore made cultures from the throats of 10 soldiers with nephritis, 10 wounded soldiers who had not got nephritis, and 10 male civilian patients of military age suffering from various surgical diseases. He found that the soldiers' throats were, as far as bacteriological examination went, in a healthier condition than the civilians, while the

throats of the soldiers with and without nephritis were closely similar. He also estimated the streptococcal antibodies in the blood of some of these cases, but found no evidence of any excess, which is an argument against the existence of a recent streptococcal infection.

We next made investigations as to infection by an ultra-microscopic filter-passer. Mr. Mackenzie Wallis has produced a definite illness in rabbits and monkeys after an incubation period of eight days by injections of urine, prepared so as to be free from bacteria, but containing any filter-passer present. These results demand consideration, even though he has not succeeded in producing nephritis, for the incubation period of eight days excludes a mere chemical cause for the illness and corresponds to the incubation period which has been estimated clinically in some cases. In this connexion the results with Wassermann's reaction are of interest. The reaction was positive in 18 out of 56 cases, being strongly so in 4 and feebly so in 3—i.e., it was positive in practically 1 in 3—a higher proportion than that of syphilis in the army in general. This may mean that men damaged by syphilis are more liable to nephritis, or that the positive reaction was not due to the spirochæta pallida, but to some other animal infection, such as a filter-passer is generally assumed to be.

Signs and Symptoms.

I intend only to call attention to those features of the disease which seem peculiar to the present outbreak. But there is one point on which it is very important that we should get evidence from those medical officers who have seen cases in the early stages. There are a number of febrile conditions occurring among the troops, and it would be interesting to know whether acute nephritis is specially apt to occur among those who have had any such febrile attack. Lieutenant F. G. Chandler, medical officer to the 2nd Argyll and Sutherland Highlanders, told me that in several cases there had been diarrhœa of sudden onset, or a temperature of 103° F., with pain in the limbs and shivering for 24 to 48 hours before he found albumin in the urine. Other medical officers have reported œdema without albuminuria at all. In the majority of cases the first thing that the patient noticed was the œdema, which usually started in the face and legs and remained curiously localised sometimes, though more frequently it became generalised. Œdema was almost a constant feature, being present in 53 out of the 58 cases; and of the 5 in whom it did not occur 4 gave a history of previous nephritis. In all my cases the œdema soon cleared up.

One of the most striking points was the frequency of dyspnœa as an early symptom; it was definitely present in 49 cases. Of the 9 who did not complain of it, 2 had no œdema, while the œdema was slight in 2 others. As a rule, the shortness of breath started at the same time as the œdema, but did not last so long. The alveolar CO_2 was determined by Mr. Trevan in 5 cases during the dyspnœa. In 3 it was normal, while in the remaining 2 it was reduced from the normal 5 to 3 per cent. Since dyspnœa due to acidosis is always associated with reduction of alveolar CO_2, and uræmic dyspnœa is of this type, it would appear that the shortness of breath was not always associated with acidosis, uræmic or otherwise. I do not think that dyspnœa is usually regarded as a common feature of acute nephritis, apart from uræmia or cardiac failure. But the majority of these cases were not so ill that either the kidney or the heart was failing, and none of them showed signs of cardiac dilatation. The close agreement between the onset of œdema and dyspnœa suggests that the outpouring of fluid into the lungs or pleural cavity may have been responsible for the shortness of breath. This is supported by the frequency with which a cough and bronchitis also occur. Some of the cases showed a return of respiratory distress after their journey from France.

A slight and irregular temperature was common in the earlier stages, and was sometimes prolonged where recovery was slow. The blood pressure was very variable, being raised in some cases but not in others. I did not find that it was much help in prognosis, though probably the best thing is for the blood pressure to be raised at the beginning and soon to fall to normal. In the discussion at Vienna, Schlesinger noted a curious fact—that in a great number of cases hypertrophy of the heart did not supervene.

I noted a great variability in the amount of urine secreted. Often it was markedly increased while the disease appeared to be fairly acute—i.e., there was hyposthenuria or an inability to secrete a concentrated urine. It was certainly a more marked feature of these cases than in the acute nephritis met with in civil practice. I did not observe, even in early cases, the extreme reduction in the quantity secreted, such as is usual in ordinary acute nephritis. Red blood corpuscles were found in 44 of the 58 cases; the amount was very variable. The urine was sometimes bright red with blood, sometimes merely smoky, and often chemical and microscopical tests were needed to detect the blood. As the hæmaturia cleared up there was frequently a flocculent reddish-brown precipitate in which alone the blood could be found. I was struck with the fact that in a good many cases blood continued to be poured out in some quantity long after all other acute symptoms had subsided, as though the damaged kidney continued to leak blood rather than that there was a hæmorrhagic inflammation of the kidney.

There was generally a considerable number of leucocytes in the urine, just as there was leucocytic infiltration of the kidney in the fatal cases. At first I thought this was a feature special to this form of nephritis, but Mr. Mackenzie Wallis finds that it is equally marked in scarlatinal nephritis. Casts were found in all but 3 cases; usually there was a mixture of epithelial, granular and hyaline casts. Blood casts and fatty casts, on the other hand, were uncommon. Crystals were rare in the urine. Calcium oxalate was found twice, and crystals of uric acid once. The rarity of organisms in catheter specimens has already been referred to.

As to complications, fits presumably uræmic in nature occurred in 4 of the 58 cases. They all made a good recovery, and I was of opinion that free venesection contributed to this recovery. Mr. Foster Moore examined the eyes of patients under the care of my colleagues and myself, and reported that he found retinal hæmorrhages in some of the acute cases, but that retinitis only occurred in those cases which had definitely become chronic.[2] Captain Abercrombie has observed some interesting complications bearing on a possibly infective origin such as herpes and parotitis.

Milkiness of the blood serum referred to by Bright in his original account of the disease was not observed in any of the 56 cases in which the

[2] THE LANCET, Dec. 18th, 1915, p. 1348.

blood was drawn for Wassermann's reaction, but was present in a fatal case under Major Calvert's care.

Course and Prognosis.

On the whole it may be said that the disease has run a favourable course, although I assume that I only got the more protracted cases sent home from France. A patient who developed the disease immediately after he returned from France on leave and who was admitted to hospital on the second day of the disease was free from albuminuria on the fourth day. Only one of the 58 cases died, and in no other case has life appeared to be in danger. Most of the cases have felt quite well as soon as the œdema subsided, though some complained of headache, cough, and digestive disturbances for a week or more. Yet many of those who felt and looked quite well were still passing albumin, blood, and casts. As they recovered the albuminuria often became intermittent, and there has been a curious tendency to remission and relapse. Some of those who had apparently recovered and had gone to convalescent homes soon relapsed. Often the patient has been able to tell from his own sensations whether the albumin has returned or increased. It took as much as 14 weeks for the albuminuria to cease in some cases, and others continued to pass blood and albumin even five or six months after the onset.

The diastase reaction in the urine is a valuable aid to prognosis. Not only are those cases worse in which the diastase output is lowered or absent, but if the lowered output persists after the albuminuria has ceased the patient seems liable to relapse. A case therefore cannot be regarded as cured until the diastase output has returned to normal, and I would suggest that it is important for this test to be done in all doubtful cases before return to duty. Schlesinger is of opinion that the subjects of hæmorrhagic nephritis are no longer fit for active service, though Strasser thinks that they may still be used for less strenuous military duties. On active service such patients are liable to relapse.

Treatment.

I will say little on this head, as I have really nothing fresh to add to our common knowledge on this. As nitrogen retention is a common feature of the early cases, I have adopted a diet poor in nitrogen though varied and fairly liberal in carbohydrates and fat for limited periods in the earlier stages. Sometimes this has produced distinct benefit, but sometimes it seems to make little or no difference. I am convinced that prolonged nitrogen starvation is as bad for the nephritic as for anybody else.

Conclusions and Suggestions.

Conclusions.—1. These cases are true examples of acute nephritis, as shown by (*a*) the combination of œdema with albuminous urine containing casts; (*b*) the nature of the proteins in the urine; (*c*) the tests for renal permeability; and (*d*) post-mortem evidence.

2. The cases have been too prevalent to be merely accidental, and the close similarity of the symptoms suggests a common cause.

3. Exposure, water-supply, metallic poisons, or intestinal toxæmia can be excluded as the cause. The prolonged cases showed a high percentage of positive Wassermann reactions.

4. The curve of incidence both in this war and in the American Civil War suggests an infective agent, as does the unequal degree to which the different units were affected. This is supported by the extent to which the glomeruli were involved, as shown by the chemical tests and the post-mortem evidence.

5. So far bacteria have not been found responsible for the infection, though more positive evidence might be obtained from earlier cases. Results suggestive of a possible filter-passer have been obtained, but they are not conclusive. The point of entrance of the infection is possibly the tonsils and upper air-passages. I suggest that there is a specific organism responsible which resembles but is not identical with that causing scarlet fever.

6. The outstanding clinical features of the epidemic are: (*a*) The frequency with which shortness of breath occurred at the beginning; (*b*) the great variability in the duration; (*c*) the tendency to remission and relapse; and (*d*) the ultimately favourable prognosis in the majority of the cases.

Suggestions.—I would make the following suggestions:—

1. That animal experiments with the saliva and urine from recent cases should be carried out. The lack of definite evidence so far may be due either to the infective stages being over before the patients reach England or to the difficulty in inducing nephritis in the animals employed.

2. That investigations should be made as to the exact distribution of the cases. This might be done by means of maps on which the cases could be dotted according to the place of origin. There is an impression that certain billets are particularly associated with the disease. A map would afford valuable evidence as to the kind of place where the disease is contracted, and therefore as to the possible source of the infection. Until this is done it would be useless to try to isolate the cases; probably they are only infectious in the early stages, and are so no longer when they reach the base hospitals. Yet some may still be infectious, since orderlies at these hospitals have contracted the disease. In the meantime it might be well if the urine and sputa were treated as the excreta in the cases of typhoid.

3. That arrangements should be made for the urinary diastase to be estimated in doubtful cases before return to duty is allowed.

I would urge that we have a remarkable opportunity of studying the pathogeny of nephritis in general and of rendering aid to the efficiency of our forces by checking a disease which incapacitates a number of otherwise healthy men. The next chapter in the inquiry will have to be carried out in Flanders. I feel sure that anyone investigating the disease will find, as I have done, a sympathetic helper in Dr. Walter Fletcher, the secretary of the Medical Research Committee.

In conclusion, I should like to express my indebtedness to the staff of the pathological department of the hospital under the direction of Professor Andrewes for their willing coöperation, and to Mr. Mackenzie Wallis and Mr. Trevan, who made the chemical investigations.

Since writing this paper I have seen Sir John Rose Bradford's note on the subject in the *Quarterly Journal of Medicine* for January, 1916. It is gratifying to find that from a more extended number of cases he has come to conclusions practically identical with those I published in the July number of the *Journal of the Royal Army Medical Corps.*

Welbeck-street, W.

THE USE OF CONDENSERS IN THE DIAGNOSIS, PROGNOSIS, AND TREATMENT OF NERVE LESIONS.[1]

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THE terms "faradic response," "galvanic response," "normal reaction," and "reaction of degeneration" are, of course, familiar to all. For half a century electricity has been used as an aid to the diagnosis and prognosis of nerve lesions. Men very skilled and experienced have been able to claim a fair degree of success, but failures have been numerous, so much so that not a few eminent surgeons and neurologists have stated that the method has little or no value. For this latter view two facts are chiefly responsible—the utter crudity of the apparatus until recently in use; and the tendency to look upon electro-diagnosis as a thing apart, and not as something to be fitted into its proper place in an ordered scheme of investigation.

A current of electricity flowing through a voluntary muscle produces no visible effect so long as it remains steady. When the potential is suddenly altered a "twitch" or single contraction occurs. At voltages of 25 and upwards the normal muscles will respond to impulses which fall to zero in a very brief period—some thousandths of a second. Other things being equal, the intensity of the contraction in a normal muscle is most affected by the voltage. But in the case of a muscle which has been for some time cut off from its motor cells in the spinal cord, the time factor assumes the chief importance. Voltage continues to exercise an influence, but however much it be raised the muscle will not contract unless the electric impulse lasts a certain minimal time.

A faradic coil may be described as an instrument by which an evenly flowing current of low voltage is transformed into a series of short discharges of relatively high potential. The voltage of the interrupted current, as led off from the secondary terminals, is determined by the intensity of the current circulating in the primary of the coil, and by the construction of the coil itself as regards number of turns of wire and other details. The duration of each impulse and the number delivered per second are matters which depend upon the working of the interrupter. The former was assumed by the late Dr. Lewis Jones to be in the neighbourhood of 1/800th of a second, so far as its effective portion is concerned. The latter varies between 20 and 50 per second. As regards the duration of each impulse, however, the above estimate can only be taken as approximate, and the time may in some cases be much longer.

It is often said that a given muscle "responds feebly to faradism." No particular type of coil is specified, nor is any statement made as to voltage in the primary. And even if these data were given, no one can be certain, with the platinum hammers commonly in use, what was the duration of the impulses used; nor—a point not without importance—the *rate* at which they were discharged. The phenomenon described—"feebleness of reaction"—is not one about which different observers are likely to be in exact agreement. In practice, of course, judgment is helped by a comparison with the sound side, if there is one, or with one's own muscles. The hopelessly unscientific nature of the whole proceeding may perhaps be best appreciated by analogy with another well-known means of diagnosis. Conceive men using clinical thermometers without scales, filled sometimes with mercury and sometimes with spirit, and having varying bores of unknown dimensions. Individual physicians might, and no doubt would, become remarkably expert in the use of the particular instrument which they possessed; but records of their cases would be of only small value to other observers. The faradic coil is doomed as an instrument for diagnosis, although its rapid succession of impulses and relatively high voltage must not be lost sight of in designing a successor. The galvanic battery or its equivalent will probably survive, as the continuous current lends itself to exact measurement. The customary record of milliampèrage alone, without taking into account voltage or resistance is, however, almost worthless; to this subject I shall return later when discussing condenser discharges. Even if accurately controlled, the continuous current cannot enable us to explore the whole diagnostic field which lies beyond the range of ordinary faradism; for in it are many fine shades of abnormality which call for great range and accuracy in the instruments used to detect them.

The object of the foregoing remarks has been to show that, up to very recently, the first essential to the placing of electro-diagnosis on a sound footing has been absent. The use of precise instruments in an agreed manner to secure definite and readily recognisable results is a condition of scientific progress. The experience of one man, however learned, is never sufficient to establish a new truth unless the phenomena on which he bases his deductions can be reproduced and confirmed by his confrères. The advent of the condenser system of nerve testing enables us for the first time approximately to fulfil these requirements.

Let it be said at once that this system introduces no principle entirely new. A condenser may be regarded as a means of storing a definite quantity of continuous current, as one might store water in an elevated reservoir. If we imagine a series of reservoirs of increasing size, all containing fluid at the same level, and all having outlet pipes of the same bore, it will be obvious that the time taken by each to empty—to discharge itself—will be determined solely by its size or "capacity." In the case of condensers the material of the discharging circuit takes the place of the pipes, and the resistance of this material is the equivalent of their bore. That is to say, so long as the conditions in the discharging circuit do not vary, the length of time taken by various condensers to empty themselves is proportional to their size. When the resistance in the discharging circuit remains constant the amount of energy flowing in that circuit at any given instant is always the same, no matter what the size of the condenser may be, but the larger the condenser the longer the flow will last. If the resistance is diminished the flow of current is greater, but lasts for a proportionately shorter time. A condenser, A, twice the size of another condenser, B, may give double the amount of current for the same length of time, or give the same

[1] A paper read before the Sections of Surgery, Medicine, Neurology, and Electro-therapeutics of the Royal Society of Medicine, on Feb. 2nd, 1916.

amount of current for double the time. It cannot under any circumstances give an impulse lasting simultaneously double the length of time and an increased quantity, for such a thing would in effect be creation of energy.

The method of condenser nerve-testing worked out by the late Dr. Lewis Jones is based primarily on time values. He chose a fixed or standard potential—100 volts, assumed that the body resistance was always in the neighbourhood of 1000 ohms, and then selected 12 condenser capacities so graded that their discharges ranged in length from 1/24,000 of a second to 1/200. (See table.) By

Table of Condenser Values, &c.[2]

No.	Capacity.	Discharge duration.
1	0·016 micro-farad	1/24,000 second.
2	0·025 ,,	1/16,000 ,,
3	0·05 ,,	1/8,000 ,,
4	0·062 ,,	1/6,000 ,,
5	0·08 ,,	1/4,800 ,,
6	0·125 ,,	1/3,200 ,,
7	0·25 ,,	1/1,600 ,,
8	0·33 ,,	1/1,200 ,,
9	0·5 ,,	1/800 ,,
10	0·66 ,,	1/600 ,,
11	1·0 ,,	1/400 ,,
12	2·0 ,,	1/200 ,,

a device which I need not now detail, he secured a further three grades of 1/100, 1/70, and 1/30 second. He found that many muscles which responded well to faradism were indeed not normal, and that those irresponsive to it showed wide differences in the length of the condenser impulses which were required to excite them. This time standard has been criticised on the ground that not only were longer impulses necessary to excite injured muscles but larger condensers, and that it was impossible to say which factor was the more important. This criticism displays confusion of thought, for the larger condensers, as it were, use up their largeness solely in maintaining their flow of current for a longer period.

The system of reckoning degrees of injury in muscles by determining the length of condenser impulse necessary to excite them is free from fallacy only so long as the voltage and resistance remain constant. The former factor is easily controlled; the latter is subject to some variation. Lewis Jones's assumption of a body resistance of 1000 ohms holding good approximately for all condenser impulses has not been confirmed by experience. In practice, however, it is nearly always possible to achieve a minimum resistance, which does not differ greatly between one person and another, by first soaking the limb in hot water (or applying hot fomentations), and then rapidly running up to high condenser numbers. After several long impulses have thus been discharged a rest of one minute is given to the muscle. One then works backward until the shortest impulse is arrived at which will cause an ascertainable contraction. At the Cambridge Hospital the reaction of the muscle is recorded in a kind of shorthand—thus: "Tibialis anticus, No. 10, L.J.S., 100." The initials indicate "Lewis Jones scale," and the number refers to the particular stud on the Lewis Jones instrument. These numbers have been attacked as "meaningless." On the contrary, their meaning is most precise. Written at full length, No. 10 means that, under certain standard conditions, subsequently to be detailed, the particular muscle investigated requires the impulse from a condenser having a capacity of 0·66 micro-farad, charged at a potential of 100 volts. The universal use of the numbers 1 to 15, so far from being confusing and unscientific, would, on the other hand, compel that very standardisation of instruments and uniformity of method which have hitherto been so conspicuously lacking, and which it is the chief object of this paper to advocate.

The original Lewis Jones instrument for diagnosis charged and discharged its condensers by means of a metronome. The muscular contractions which it was possible to produce were therefore limited to a series of single twitches similar to those produced by making or breaking a continuous current. Now, it is well known that in the old system of nerve-testing the response to coil currents sometimes returns, while that to battery currents still remains feeble. In coil current we have the effect of summation of stimuli, due to the rapid discharge into the muscle of a succession of impulses at a high voltage. In the case of a coil none of the factors concerned can be measured. In the modification of the Lewis Jones instrument which I have introduced any number of impulses can be produced between 1 and 20 per second or more, 20 being the minimum number to produce tetanisation. This number is recorded, the nature of the individual impulse is under control, and the voltage is known. Thus an exact record can be made of the condition of a test. I have not yet seen a muscle which would respond to faradism which would not respond to tetanising condenser discharges at 100 volts. If such should occur, however, I have little doubt but that it would respond at some potential between that and 200.

In order to obtain discharges of a longer duration than 1/200 of a second, Lewis Jones used his last three studs over again at a voltage of 200, and through a resistance of 5000 ohms. The modified instrument which I have mentioned was constructed some months ago, and is arranged to make this transfer automatically, three extra studs being added for the purpose. Although this is convenient, it is accomplished at a sacrifice of flexibility, and I propose having it altered so that any voltage may be used on any stud, and also a definite resistance thrown in wherever desired.[3]

This may seem at first sight a contradiction of what I have said with regard to standardisation, but it must be remembered that we are not yet certain about our standards in all cases. My own experience is practically confined to the upper and lower extremities. In the arm a standard voltage of 100 gives excellent results in diagnosis and prognosis. In the lower limb, the same voltage has, on the whole, been satisfactory, but anomalies have been encountered. Major Bailey, of Brighton, informs me that he has had several cases involving the facial muscles and the tongue, and that he has had to adopt a lower charging potential in order to obtain good results. The converse appears to be sometimes the case in the lower limb, and we may perhaps have to adopt a standard voltage of 125 or 150 in testing thigh and leg muscles. Meanwhile the original 100 volts may be regarded as entirely satisfactory in the upper extremity.

So far I have dealt with the *standardisation of the instruments* used in electro-diagnosis. That

[2] Reproduced from Lewis Jones's original paper, Proceedings of the Royal Society of Medicine, 1913, vol. vi., Section of Electro-Therapeutics, pp. 49-59

[3] The modified Lewis Jones instrument, fully equipped with all the devices found useful by the author, has been placed on the market by Messrs. W. Watson and Sons, 194, Great Portland-street, W.

they should be employed in a *similar manner* if the results obtained by one observer are to be compared with those of another, is a matter of equal importance. Complete uniformity is perhaps too much to hope for, but at least any method adopted should be simple enough to permit of its being accurately copied from a written description only. The following procedure is used at the Cambridge Hospital:—

1. *The electrodes.*—Rectangular pads are used, 2 inches by ¾ inch, which are moistened with tap-water. Both electrodes are placed on the muscle under examination, one on the motor point and one elsewhere. When possible they are pressed flat on the skin; but in some cases, as with the extensors of the thumb where these are very feeble, it is necessary to pinch the muscles up between the electrodes in order that their faint contraction may not be obscured by spreading of the necessarily powerful impulse used to excite them. The limb should be held in such a position as to relax the muscles under examination.

2. *Preparation of the patient.*—The application of moist heat has already been mentioned as helping to reduce skin resistance. It is also often necessary for another reason—namely, that the excitability of a muscle is much reduced by cold. The patient himself should be fresh, so that the morning is usually the best time for an investigation. If a muscle is obviously overstretched, as by uncorrected foot-drop or wrist-drop, it should be given a few days' rest in a "relaxation splint" before a test is made. When such relaxation is not possible owing to adhesions or contractions, the prognosis is often less unfavourable than might appear from the nature of the condenser reactions.

It will be noted that the attempt to formulate a standardised electrical procedure presents one point of theoretical weakness—the factor of indeterminate resistance. Nevertheless, in practice this does not seem seriously to affect the comparability of results, the reason being that the utmost care is taken always to give any suspected muscle the best possible chance. To borrow a legal analogy, we assume that it is innocent until the most careful investigation has proved it guilty.

An account of the uses of condensers in nerve and muscle testing would not be complete without a reference to the use of the continuous current. For our present purpose a battery yielding a constant current at 100 volts may be conceived of as adding to our series of condensers one of infinite capacity and consequently infinite duration of impulse. But an impulse lasting only 1/200 of a second at 100 volts is already somewhat painful; so that we cannot in fact use such a voltage for continuous current testing, but must at least cut it in half. A muscle contracts when a galvanic current is "broken," but the factors concerned elude definite measurement. The conditions under which the excitation at "make" is produced are, however, capable of being accurately recorded. As the test is at present carried out only the milliampèrage is stated, with perhaps the size of the pad. But it is also necessary to know the voltage, as the electric pressure required to drive a given milliampèrage through the skin will vary a good deal according to the resistance of the latter. If we wish to reproduce the conditions of a given test, we must devise a means of controlling the variable factor—i.e., the body resistance. This can be done by choosing a standard, say 2000 ohms, and always bringing the total resistance of the patient's circuit to this figure by means of an adjustable rheostat. Perhaps in future it may be found possible to apply some analogous arrangement to standardise the resistance in the case of condensers. The use of the continuous current in a scientifically accurate manner offers a field for further research.

In the absence of a professed neurologist at Aldershot I was called upon very early in the war to give what assistance I could in the diagnosis and treatment of nerve injuries. The Lewis Jones apparatus, although then obtainable only in a somewhat crude form, appealed to me as likely to afford more exact information than coil and battery testing, and I requisitioned one for the electrical department. At that time there existed practically no data as to the meaning of condenser reactions in nerve injury, some observations in connexion with infantile paralysis having alone been published. In seeking to build up a system by which condenser reactions might be made of practical help in military work, it was, of course, necessary to have some sort of working hypothesis. The one chosen was to this effect: that when a muscle needed very long condenser discharges to excite it the motor nerve was cut, or so injured or involved in fibrous tissue as to be completely blocked; and that when medium discharges were required a minor degree of trauma had occurred. It was further assumed that when the condenser reactions improved month by month, recovery was taking place, even in the continued absence of voluntary movement; and that when these reactions did not so improve, the prognosis, apart from operation, was bad. These assumptions have proved very useful, and, subject, it is true, to numerous exceptions and qualifications, have in the main been borne out by 17 months' experience.

I need hardly say that it is not possible to distinguish between anatomical and physiological block. A much more important practical limitation is this. It is not possible to say whether a block actually exists at the time of the test. All that can be definitely stated is, that when a muscle responds only to No. 11 and upwards—i.e., to impulses lasting 1/400 second or longer, there has been *at some time* a complete blockage of all motor impulses for some considerable period, probably weeks.

It would appear that when a motor nerve is "blocked" for any length of time, the muscles exclusively supplied by it undergo certain changes which prevent their response to the very short electrical stimuli which normally excite them. If the change in the electric excitability always disappeared coincidently with the re-establishment of a path for motor impulses, it would be highly convenient for the diagnostician. But nature has not arranged it so. It is quite possible for the condenser reactions to remain stationary during the healing of a nerve, or even to improve somewhat, and then actually retrogress with the return of voluntary power. This phenomenon is most often seen after the freeing or suturing of a nerve. I have only once seen it occur in a case that was healing spontaneously. There is but one electrical phenomenon which I think may prove to be pathognomonic of complete blockage existing at the time of the test. When the condenser number required is 12 or more, and when the contraction of the muscle falls to zero after four or five progressively feebler efforts, operation has so far shown actual severance or complete strangulation of the nerve trunk. The non-occurrence of this phenomenon is, however, no evidence against severe injury.

The fact that high condenser numbers may be required to excite a muscle the motor nerve of which is far advanced towards recovery might at first sight appear seriously to invalidate the diagnostic value of such reactions. In practice

this is not the case, provided that the condenser response is regarded as an important, but not exclusive, means of determining the broad issue as to whether or not operative interference is desirable. The test is unreliable at any less period than six weeks after the injury. Faradic response usually vanishes in a week or ten days, but a muscle severed from its motor nerve will respond to 7 or 8, condenser scale, just after it has lost its response to coil currents. Reactions between 7 and 9 occurring in a case two or three months old would be regarded as evidence in favour of possible spontaneous recovery; but if found at the end of a fortnight or so are just as likely as not a stage in the downward path towards 12 and beyond. A case of gunshot injury near the elbow which I saw at the Cambridge Hospital is interesting as illustrating this point.

The patient was sent to the electrical department with a letter saying that his wound had occurred three months before. There were no sensory changes. The extensors of the forearm responded to No. 9 condenser scale. A report was given to the effect that the musculo-spiral was certainly not divided, but might be involved in fibrous tissue. Operation showed a completely severed nerve. It was then discovered that the wound had been received only three *weeks*, not three *months* previously. A test made one month afterwards showed no response below 12.

Most patients, however, for various reasons are not sent to the electrical department until their injury is two or three months old. Cases showing reaction of 12 or upwards are carefully examined for any trace of voluntary movement. An attempt is also made to stimulate the nerve itself above the lesion when this is anatomically feasible. If there is no movement, no nerve conduction, and also complete interruption of sensory impulses operation is obviously to be recommended, provided the surgical conditions permit of it. Often, however, the sensory path is still, to some extent, intact, and there is perhaps even faint conduction in the nerve. At first we used to give such cases a chance of recovering, carefully observing and treating them for some months. Nearly all have had eventually to be operated on and have shown definite involvement of the nerve in scar tissue. Our practice is now to operate unless delay is advisable for other reasons, such as the state of the wound.

When the reactions are between 8 and 10, inclusive, a varying period of waiting is prescribed, but cases which show no detectable improvement of any sort in two months should, as a rule, be operated on.

In a period of 12 months 25 cases were recommended for operation. In 22 of these definite injury of the nerve was found, chiefly in the form of involvement in fibrous tissue. In two the nerve looked healthy, but the bullet had passed close to it. We know that in the case of muscles they may appear sound and yet be seriously damaged within, so that it is reasonable to assume that hæmorrhages may occur within a nerve without altering the appearance of the sheath. In the remaining case in which nothing was found the bullet had passed at some distance from the nerve trunk.

The last patient referred to had been wounded in the thigh; in another somewhat similar case the patient refused operation, and after some months began to show signs of recovery, though whether this will be sufficient without surgical interference is still doubtful. No similar cases have occurred in the upper extremity. This makes me wonder if the standard of 100 volts is sufficiently high for use in the lower limb; only further experiment and observation can determine this point.

In estimating the chances of recovery without operation in any given case I endeavour to the best of my ability to take all factors into consideration; but the fact remains that my opinion is based very largely on the condenser reactions, interpreted in the light of what has been found at operation, and by the course of cases where for some reason operation, though recommended, has not been performed.

It is worth noting that musculo-spiral injuries have been very common in this war, that in many of them electro-diagnosis is the only method of investigation open, and that as a class they respond remarkably well to operative treatment—signs of voluntary power sometimes returning within five months after secondary suture, and in a few weeks after freeing from fibrous adhesions.

The electro-therapeutist should attend operations on nerves whenever possible, not only for the purpose of seeing for himself what is found, but in order to gain further information by direct stimulation of the exposed trunks. This procedure might well in itself form the subject of a paper. I mention it only to call attention to its importance, and to point out that standardisation of the currents used is not of less importance here than elsewhere.

I will now deal very briefly with the treatment of nerve injuries in so far as the condenser apparatus is applicable. In its original form only a succession of single twitches could be produced in a muscle, such as are obtained by making and breaking a continuous current. The modified apparatus which I have referred to can, if necessary, produce tetanising current, and this current causes extraordinarily little skin feeling relatively to the amount of muscular excitation, even when quite small pads are used. As the individual impulses may be of any length up to 1/30th second, the tetanisation of practically any muscle is possible, even though it be completely cut off from its motor nerves. Such a power must be used with discretion, but when electrical stimulation is desirable at all, rhythmical tetanisation is infinitely superior to treatment by what are popularly known as galvanic twitches.

The careful picking out of individual muscles and nerves is the key to success in a large number of cases, and is often neglected because it requires time and skill. Such work can rarely be left in the hands of a lay assistant. It is so easy on the one hand to produce over-fatigue; or, on the other, to fail in provoking all the required movements. I have watched work of this kind being done. I have seen the commission of almost every kind of therapeutic sin—including stimulation applied ostensibly for the benefit of weakened extensors which succeeded only in producing vigorous contraction of their normal opponents by spreading of the strong currents employed. If the stream of impulses from the condenser is more powerful for good than the older methods, it is also, wrongly used, capable of doing proportionately greater injury.

Returning once again to the question of diagnosis and prognosis, I should like to make it quite clear that I make use of sensory investigations so far as my knowledge of them goes. There has, I think, been a tendency of late to give electrical reactions a very secondary place. Some of the reasons for this distrust I have tried to point out, and at the same time to show that most failures are due to defective instruments and faulty methods. That an expert neurologist may get along quite well with only a very moderate amount of electrical knowledge may be conceded. But the converse is also true, as I have proved, at any rate to my own

satisfaction and that of the surgical staff of the Cambridge Hospital. The perfect physician would, no doubt, combine with an expert knowledge of the nervous system a complete familiarity with electrical principles and technique. But such prodigies are rare, and one is certainly justified in asking that nobody should speak lightly of modern electro-diagnosis unless he has thoroughly familiarised himself at first hand with the technique employed and the results obtained by someone who has had extensive experience of the method and who believes in its value.

Hernaman-Johnson modification of the Lewis Jones condenser set, with voltmeter, and rheostat to charge condensers at any voltage between 25 and 200. Also speed regulator to give any number of revolutions between 1 and 30 per second, and speed recorder. The patient's circuit is earth-free.

1. Electrical reactions are, and must remain, important in diagnosis; they cannot conceivably be dispensed with.

2. The older methods need drastic revision, both as to instruments, technique, and terminology.

3. The Lewis Jones condenser instrument, as modified to give either slow or rapid impulses, is an accurate and scientifically standardised substitute for the faradic coil, and also, in the great majority of cases, for the galvanic current.

4. Regarding nomenclature, the terms "faradic response" and "reaction of degeneration" should be dropped and their places taken by a statement as to the smallest condenser which will produce any appreciable contraction under given conditions.

5. As to the standard to be adopted, the condenser values originally chosen by Lewis Jones appear to do very well, and should be adhered to. His voltage of 100 works excellently in the upper extremity; it may need to be a little increased as regards the leg, and decreased for the face. The rule that a muscle should always be "coaxed" to do its best—i.e., to respond to the shortest possible impulse—must be carefully observed. The general use of the Lewis Jones values would enable muscle reactions to be designated by numbers, and thus simplify reports.

6. The condenser system offers no royal road to diagnosis and prognosis

Cavendish-square, W.

SOME NEW FORMS OF OCCUPATIONAL DERMATOSES.[1]

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THE following examples are reported for the first time in medical literature. The war has made a huge demand on the production of trinitrotoluene, nitrate of ammonium, and nitro-glycerine. They form important ingredients of many high explosives used for military purposes, such as blasting, filling bombs, shells, and hand grenades, &c. To those who have the supervision of the numerous munition works throughout the country employing these compounds, a knowledge of their possible evil influences upon the skin and how to prevent them is necessary.

Trinitrotoluene Dermatitis.

The following are some selected records of the above condition.

CASE 1.—Male, aged 45; worked in a mixing house in an explosive factory. He complained of itching and burning of both forearms and slightly on the backs of both hands. The irritation began in the wrists and was most severe at these points. The discharge had dried here and there into thin crusts. The trouble started a week after he commenced working in the mixing room. Objective symptoms: The whole of the lower parts of the forearms and wrists were covered with a mottled erythematous rash, which faded away at its upper edge. The back of the hand was reddened and harsh to the touch. Under a lens numerous minute red points appeared surrounded by a zone of faint erythema. On the wrist, especially the under surfaces, were numerous vesicles, mostly ruptured, exuding a small quantity of semi-opaque fluid. The palms of the hands showed the usual staining seen in these workmen; it varied from canary yellow to mahogany. In some places, especially between the fingers and along the outer edges of the palms, were seen some lighter rounded points under the epidermis about the size of boiled sago grains, where the skin was evidently beginning to separate and which looked as if they contained air or fluid. The man was put to other work and soon recovered.

FIG. 1.

Trinitrotoluene dermatitis, late stage, showing the massive exfoliation of the palms.

CASE 2.—Male, aged 32. May 26th, 1915. Carpenter, employed in fastening up wooden boxes in the mixing houses. Had been ill a week. Complained of intense irritation, which began between the fingers, but had now spread all over the backs of the hands and up the forearms. He also said that when he clenched his fists the palms felt very tender, sore, and stiff. There was some irritation on the inside of the thighs. June 11th: On the webs of the fingers the skin was peeling in thin fine scales, but at the bases of

[1] A paper read before the London Dermatological Society.

some of the nails large blisters were forming, which did not contain much fluid, and the epidermis was breaking away over the rest of the back of the hands in large flakes. The skin of the palms, starting at the outer edge, was being detached almost as one thick, dry cast. (Fig. 1.) June 25th: I examined the patient's thighs, scrotum, and penis. The whole of these surfaces was deeply inflamed; some parts were weeping, others crusted. Here and there were small superficial septic sores. He complained of the intolerable, maddening itching, which made walking almost impossible and destroyed all comfort night and day. He also showed me his feet, which had been causing him inconvenience for the last two weeks, but he said they were improving. On inspection the soles of his feet exhibited the same staining as is ordinarily seen on the hands of these employees. The tops of both feet were peeling in dry, thin sheets, and the thick skin of the soles was being apparently undermined at the edges and threatening to exfoliate *en masse*. The man was off work many weeks.

FIG. 2.

Trinitrotoluene dermatitis, early stage: shows well the early implication of the forks of the fingers.

CASE 3.—In this case the skin of the fingers, especially between the forks, and the backs of the index fingers and thumbs, was most affected by itching. This is usually the first and earliest symptom and seat of the trouble in T.N.T. dermatitis. The men begin to rub these parts and a fine desquamation follows. (Fig. 2.) This was a comparatively mild case, and when at work in the daytime the man said he suffered but slight inconvenience. At night the parts affected became very irritable, swollen, and puffy; this condition would subside during the day, to be renewed the following night. There was little if any oozing, and the patient likened the early appearance to a nettle-rash. He said wheals formed and the parts swelled, but these subsided in the course of a few hours.

CASE 4.—Female, aged 20. This girl filled cans with T.N.T. in the mixing house by means of a scoop. She thought the rash began like nettle-rash, and said each individual spot swelled up as large as a threepenny-piece in a few minutes, taking about 12 hours to subside. They left small red itching papules. If work was still continued amongst the powder, these wheals turn into vesicles containing fluid. In her case the back of the hands, the flexor-aspects of the forearms and flexures of both elbows were the chief parts affected, but the inner surfaces of the dorsal aspect of her feet, between the toes and the back of the heel, were intensely irritable at night and kept her awake. The skin between some of the toes was broken. The papules seen on the feet in this case were the size of pinheads and almost the colour of the skin. Between the papules was some general erythema, probably due to scratching. An irregular distribution of "sago grain" elevations was noticed on the backs and palms of the hands, varying in size from a pinhead to a pea.

CASE 5.—Male. The wrists and backs of the hands were the parts affected, though the patient complained a little of the chin and face. He stated that if he touched the skin, say of the nose, with the powder the place began to tingle. He described the early symptoms as tingling, pricking, and burning; and was of the opinion that it was only after the formation of vesicles with a little discharge that the intolerable itching was felt.

CASE 6.—Male, aged 42. Second attack. Suffered from irritation with crusting on the front and sides of the neck, backs of the hands, and the tops of his feet. It is interesting to notice that this man wore clogs and the eczematous patches on his feet (about 2 in. × 1½ in. in extent) are in front, where the clogs are fastened.

The eruption.—Between 40 and 50 cases have been under observation, but doubtless many slight cases are not brought to the doctor. The earliest rash is a superficial erythema, but as usually seen consists of patchy, irregular-shaped, slightly raised areas of redness varying in size from a pin-head to a shilling, between which is the normal-coloured skin. These spots coalesce by spreading at the edges and by the formation of new centres. The parts most affected are the hands and arms, the neck, the lower part of the abdomen, the inside of the thighs and scrotum, the back above the buttocks, the calves, and between the toes. On exposed and constantly irritated surfaces such as the arms, a continuous sheet of redness ultimately develops. The skin becomes greatly thickened and takes on what Sabouraud calls "secondary lichenification." Moisture appears to dispose towards the production of vesicles, which quickly rupture by chafing, especially on the thin epidermis of the scrotum and thighs. In this region the inoculation of pyogenic organisms readily produces superficial ulcers. The character of the desquamation follows the ordinary rules and depends upon the severity of the inflammation and the thickness of the epidermis. Crusting is slight.

Hot weather causing much sweating increases the prevalence and severity of the trouble. The exposed skin nearest the work is in every case the earliest seat of the lesions. The rolled-up sleeve will often limit the extent of the lesions on the hands and arms. A rash round the neck and on the triangular space on the skin over the throat and chest will sharply define where the collar of the overall has failed to cover and has been left open at the front. The scrotum, penis, and inner aspects of the thighs are commonly affected in prolonged cases, sometimes showing a continuous sheet of redness. The powder is introduced to these parts by the fingers when inserted there for necessary purposes, and the condition is aggravated by chafing, heat, and moisture. The powder will fall between the tops of clogs or through the fronts of boots improperly laced, causing a dermatitis on the tops of the feet. In these circumstances, if the socks are infrequently changed, much persistent irritation and trouble is found between the toes. In no case have the heads of the workers been affected.

The larger number of cases has come from amongst the workers who sieve the fine powder. This is done by hand, on a large sieve with a special mesh to retain the larger grains. During this process a cloud of the finest dust is distributed into the atmosphere and settles on all the objects in the shed. It falls especially on the bare forearms and hands of the sievers.

The other workers affected have been employed in the same sheds—e.g., those filling the fine powder into tins with scoops. These girls have suffered comparatively lightly. One man, with a very severe eruption, was engaged in one of the mixing sheds, packing the full tins in boxes. Though his contact with the powder was not so direct, the amount of fine dust in the air, added to that which had settled on the wooden cases he was fastening up, was enough to set up very serious trouble. He was evidently a highly sensitive

subject, and was probably uncleanly and careless. Occasionally those who "weigh out" and "trolley" crude trinitrotoluene are affected.

Personal experiments.—The finished explosive is made up of finely powdered aluminium, trinitrotoluene, and nitrate of ammonia. The important question was to decide which of the component parts of the mixed explosive was the active irritating agent, and whether this action was shared by more than one. I tested the ingredients in the following manner:—

On June 22nd, 1915, a sweltering hot day, I applied about two teaspoonfuls of finely powdered aluminium on lint to my left forearm. I covered this with a large piece of jaconet and firmly bandaged the whole in position. The right forearm I treated similarly with an equal quantity of trinitrotoluene, the left leg with nitrate of ammonia, and on the right leg a mixture of nitrate of ammonia and trinitrotoluene.

In about six hours I noticed a warm sensation with slight pricking in the left forearm, but not enough to cause me any inconvenience. On the right forearm the burning feeling and pricking sensations were very pronounced. In 12 hours, although no powder had been applied to this particular part, the bend of the right elbow felt constantly uncomfortable, especially on movement. The right forearm felt tender and sore, as if raw, when the bandage was touched. The soreness on the right forearm, though not unbearable, was constant, and one felt one would have been glad to remove the application. At no time was there any *itching* in either of the forearms. On the legs I was not conscious of the presence of the bandages. Twenty-four hours later both calves were slightly painful to pressure through the bandages.

Up to the end of the experiment, which lasted 24 hours, the right arm was increasingly causing inconvenience, burning and pricking being the special features, but no itching, the prickle-celled layer apparently not being involved. When the bandages were removed the left arm and right leg were practically normal. On the left leg, where the nitrate of ammonia had been applied, particularly where the larger grains had lain, the pressure of the bandage had indented the skin and there was a little redness, but it was slight and unimportant and not tender to the touch. On the right forearm, wherever the T.N.T. had been applied, the skin was acutely inflamed and suffused with a brilliant red efflorescence. The parts were most sensitive and tender to the touch. A week later the skin peeled off in thin flakes. At the end of a month loose flakes of skin were still coming away in tags, and the tawny yellow colour of the skin was very noticeable wherever the skin had not desquamated. The finger-nails of the right hand were a pale canary yellow.

This personal experiment is quite convincing. A further proof that the trinitrobenzene is the irritating agent is borne out by observing that up to the time of writing no case of dermatitis has originated in any of the mixing houses where trinitrotoluene has been absent from the ingredients sieved. It is sieved at a temperature about 55° C. (131° F.), but at ordinary temperatures T.N.T. in fine dust is irritating.

The injurious ingredient.—The raw T.N.T. powder, as I have seen it commercially, is in two forms, crumbs or granules, and fine plate crystals. Both consist of broken-up fine crystalline spicules. A pure variety separated out by alcohol is used solely for priming purposes. This inflammation of the skin is caused by the presence of either variety on the skin, in very fine powder. It seems improbable that the other substances incorporated with it play any part in the production of the dermatitis described above.

I believe it to be an axiom of chemistry that "mechanical subdivision assists chemical action," probably by increasing the intimacy and area of contact. Trinitrotoluene thus falls into line with the other dermatoconioses, and is on all fours with the dermatitis caused by the powders of certain explosives—e.g., methyl aniline, described by Dr. Legge, fulminate of mercury, and the fine floury dust distributed in the packing and crystallising of dinitrobenzene.[2]

Incidentally it is interesting to note that any parts of the white cotton underclothing of the workers exposed to the powder are coloured pink and the fair hair of the employees becomes a picturesque bronze. The nitro-salts of benzene, toluene, and xylene are neutral salts with an acid reaction, and when they combine with an alkaline base such as lime, soda, or potash they give this pink colouration. Washing soda left in the clothing brings it out. Trinitrotoluene is an acid stain, and the creases on the palms are marked as bright yellow lines. The other parts of the hands vary in tint from yellow to brown due to the use of soap. The feet are often similarly affected.

Prevention.—These skin affections, besides causing suffering and inconvenience to the workman, interfere very materially with the details of management. Causes contributing to their outbreak are: The heat during the summer months and consequent excessive sweating amongst the employees, prolonged working hours, owing to the heavy demand, and possibly the lack of skilled workmen due to the scarcity of labour. New hands are not as careful and discriminating as more expert workmen, and the admission of susceptible men, or even those suffering from other mild forms of skin disease, cannot be altogether prevented when the need for hands is urgent.

To prevent this dermatitis the essential thing is to avoid, wherever possible, the scattering of powder containing minute particles of trinitrotoluene. This dust in clouds is easily seen and is obvious during the processes of sieving and filling the canisters in the mixing houses. The former is, I believe, the chief cause, but slight dermatitis amongst canister-fillers is quite common. The cartridge-fillers have never shown this trouble. The ingredients should be sieved prior to the admixture of trinitrotoluene.

Precautions.—In all the cases, without exception, the arms have been affected. This is because, contrary to rules, the men roll up the sleeves of their overalls, and the powder, instead of falling on the sleeve, which is intended for the protection of the workers, falls on the skin. There should be no opening in the cuff of the sleeve through which the powder can penetrate to the wrist. If any dry fine powdered trinitrotoluene floats in the air gloves will be required to protect the hands. I have always been very chary in advising the wearing of gloves in dusty occupations, as I find from experience that men are very careless in their use of them. If the powder gets into the gloves, or the gloves have powder on them when put on, the combination of warmth, perspiration and irritating powder increases the trouble. If gloves are worn the hands must first be thoroughly washed and carefully dried. The gloves should be of wash-leather or closely woven cotton and free from the powder inside. When worn the cuff of the glove should be inside—that is, under the sleeve of the overall—and both fastened securely at the wrist, so that no dust can fall through the cuffs of the gloves.

In a fair percentage of cases the tops of the feet and the toes have suffered from inflammation. I notice that this is particularly common in men and women

[2] Vide Occupational Affections of the Skin, p. 87. From a personal experiment which the writer made he found dinitrotoluene to be quite unirritating to the skin.

who wear clogs. There is no doubt that clogs do not give sufficient protection to the ankles and the powder percolates between the fastenings, thus causing trouble. I have advised the men, whenever possible, to wear boots, the tops of which are satisfactorily covered and protected by the trouser-legs. Stockings should be often shaken and changed. Open-work stockings, so much in vogue, even amongst women munition-workers, are the despair of the prophylactician. Substantial well-fitting gaiters are a valuable safeguard to the feet. The overalls in the mixing houses require careful supervision. They should be clean and dry, all the openings should fasten securely and overlap, and the collars should be high. There has been no trouble so far in the head; I attribute this to the use of caps which should completely cover the hair.

Nitrate of Ammonia Dermatitis.

Nitrate of ammonia does, under special conditions of temperature, subdivision, and predisposition, cause an occupational dermatitis. Amongst a number of men who work in a perpetual cloud of this dust at a temperature of about 110° F. I have observed two cases. Both were slight—that is, the men were never invalided from work, although the itching was described as sometimes intolerable, especially at night. The rash is in the earliest stage a faint erythema. The first case had persisted a whole month when I inspected the patient. This man held open the mouths of sacks which received the ammonia from the drying chamber, with arms bare. These and the tops of the feet were the only parts affected.

The second case was seen in a man who emptied boxes containing the coarse salt into a steam-jacketed mill with a revolving beater. This machine both dries and breaks up the lumps of ammonia. When the workman opens the lid of the mill to pour in the powder some of the contained dry, hot, fine floury dust escapes and settles on his arms and the flexor surfaces of his elbows. All remark that any sore or crack into which nitrate of ammonia gains access causes smarting.

A third case of dermatitis situated on the back of both hands, but more particularly the right, was due to breaking up with a hammer the consolidated blocks of this substance after its removal from the wooden casks in which it arrives at the explosive factory. Attention to the overalls is very necessary to avoid this trouble.

Stomonal Dermatitis.

One example of stomonal dermatitis has come under my observation in a dataler. His particular work is to distribute the cartridges containing this explosive to the men in the mine. He states that not infrequently a cartridge becomes broken and its contents are scattered into the tin and over the stock of cartridges which he hands out to the men. The powder causes severe smarting wherever it touches the skin, and, he says, burns holes in the glove which he wears to protect the right hand. The man has bought three pairs of gloves during the last month, and all of them show great holes in the thumb and the ends of the first and second fingers. He attributes the breaking of the cartridges during the last six weeks to the cases being made latterly of a less strong material. Prior to this none of the contents were ever spilled, and he never suffered from any dermatitis, although he has been doing the same work, with the same explosive, six months.

Upon exposure to the air stomonal powder soon becomes very wet. The rash from which the man mentioned above is suffering is situated upon his right hand, forearm, and round his neck. These parts are very itchy, and when cracks form, as they do in the later stages of the trouble, they become very deep. If any powder gets into them he describes the pain as feeling like a hot skewer being pushed into the sore. The eruption, in the early stage, is erythematous, but later presents the appearance of eczema rimosum, with deep fissures, especially on the fingers, thumb, and outer edges of the right hand.

The following is an approximate composition of the powder:—

Nitroglycerine	11 parts.
Nitrate of ammonia	57½ ,,
Nitrate of soda	7 ,,
Chloride of soda	20½ ,,
Wheat flour	8½ ,,
Moisture	1 part.

Probably the nitroglycerine and large proportion of common salt are responsible for this condition, and the means for its avoidance are palpably evident.

Treatment.

It is often a difficult task to give relief in cases of dermatoconioses, and as the method I find most useful is not suggested in text-books on dermatology it may be worth mentioning.

My first application is a paint. This paint has been for many years my routine topical remedy in impetigo, the intertriginous group of skin diseases, and in all secondary impetiginisations, which so frequently prolong and delay the healing of eczema. In localised erythematous and papulo-vesicular eczemas, and in the later lichenoid form, it gives, after a few moments' smarting, a great feeling of relief. In patchy eczematised seborrhœa, so resistant to many lotions and ointments, it subdues the itching and assists the usefulness of further treatment.

I have proved its worth in many other skin troubles. I never prescribe it for the patient's own use, but myself dab it freely on the inflamed and itching parts. It must not be used to irritable mucous surfaces. In the early pruriginous stage of these special forms of dust dermatitis it is of the greatest value, and its repetition is requested by the invalid.

℞ Camphor	℥ ii.
Acidi carbolici	℥ iss.
Hydrarg. perchlor.	gr. xv.
Picric acid...	℥ ss.
Sp. vini rect.	℥ vi. ℥ vi.

M. Fiat pingt.
Sig. Apply by a swab or brush.

For home treatment I prescribe 2 ounces of the paint mixed with 4 ounces of lotio calamin. co. and the addition of ½ drachm of pulv. acaciæ.

Ointments are inadvisable during the day-time, when the men are exposed to the dust of their trades, but worn at night or under bandages the following is very soothing:—

℞ Zinc. oxidi	1 part
Acidi oleic.	9 parts.
Stand for 2 hours.	
Emplast. plumbi	10 ,,
Parenol solid	25 ,,
Parenol liquid...	13 ,,
Hydrarg. ammon.	2 ,,

Fiat ung.

Later the treatment follows the usual dermatological lines.

Conditioning Dermatitis.

CASE 7.—Male, aged 13, working in the "conditioning" cellar of a cotton mill. The boy arranges the tubes of cotton thread as they come from the spinning frames in layers, and puts between each layer a damp, thick cloth, which he previously wrings out of a watery solution containing some chemical. He has constantly to break off the loose ends of cotton on the tubes by winding the ends round his fingers. He does this to prevent a further unwinding of the cotton off the tubes. The cotton threads cut into his fingers, which are continually smarting, especially where the thread has cut his skin. The backs of the fingers are always sore and crack; the skin at the base of the nails also is jagged and torn. The smarting is particularly noticeable at night when the patient is at home. To soothe the irritation he applies vaseline. He worked at the mill six months and then had to give up, owing to the discomfort. He says many of the other lads suffered in a similar manner.

CASE 8.—A second lad was seen by me who had worked in the same cellar at the same employment. His symptoms were not so well marked, as he had left off this work some time before I saw him.

In both these instances the agent added to the conditioning water is a fluid called "Anti-mildew Conditionite," a preparation containing formaldehyde.

Wet Winders' Acroasphyxia.

The two following interesting cases were brought to my clinic by my colleague, Dr. F. Rees.

CASE 9.—Female, aged 17. Had been working in "wet bobbin winding" of "warp" for four years previously in the same mill without suffering any inconvenience. Had never suffered from chilblains, though her hands were generally cold. The heart and urine were quite normal. Had never suffered from cramp or pain in the fingers. She left her work two weeks ago as she felt she was unable to do it as well as usual. The girl said that recently something had been put into the "conditioning" water to prevent the thread from going brown.

On examination the hands felt cold and clammy, though the day was a very hot one in June. The palmar aspects of the fingers were distinctly dark blue and appeared slightly swollen. The thumb and the index finger more especially showed this leaden blue colour over their whole extent, and the terminal phalanges of the other fingers were decidedly blue, but the darkness gradually faded away towards the palms. The palms were dusky red, and pressure over any part blanched the skin and left a dead, yellow-white, sharply defined impression. The dusky-red appearance took quite an abnormal length of time to return when pressure was removed. The backs of the hands and the skin of the lower parts of the forearms had also the same dusky-red colour. On the tips of the first, second, and third fingers of the right hand, and the tip of the second finger of the left hand, were seen superficial scars and the remains of slowly healing sores. The palmar surfaces, and to a less extent the skin of the backs of the two distal phalanges of both hands, as shown in the shaded parts of the diagrams, were totally insensitive to the prick of a pin, and also to the application of a test tube containing hot water. Outside these areas the pin prick was painful, and the tube of hot water could not be borne. (Figs. 3 and 4.)

After a month's absence from work the cyanosis was less marked, and only the very tips of some of the fingers were still insensitive to the hot test tube, and plunging a pin into these parts caused no pain. (Fig. 5.) The lividity was pronounced in the ends of both index fingers six weeks after leaving off work, though sensation to heat and pain was quite recovered from and as acute as on my own fingers.

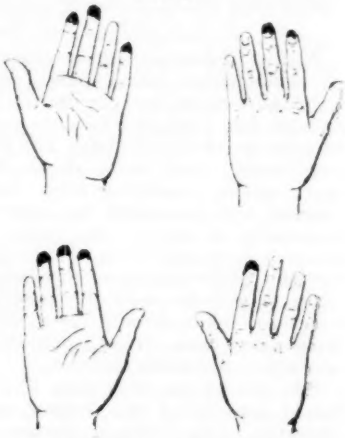
FIG. 3.

Anæsthetic areas on June 5th.

FIG. 4.

Anæsthetic areas on June 9th.

FIG. 5.



Anæsthetic areas on July 4th.

Wet winders' acroasphyxia due to potash alum. Areas of total anæsthesia to prick of a pin and hot test tube are shaded. (Case 9.)

CASE 10.—Female, aged 22. Had worked in the same winding room many years, but had been employed in "wet winding" for some weeks only. The arms were naturally brawny and red, and the girl had for a long time been subject to cold hands and a poor circulation. She said that her fingers from the tips to the forks got quite blanched and felt numb, tingling, and stiff after her work. Both hands and all the fingers felt very cold to the touch, and there was the same slow return of the circulation after pressure. The hands and fingers looked quite cyanosed, and the finger-nails had a dark look. Sensation was defective, and in some parts quite lost, to the prick of a pin and to the application of heat on the skin of the two terminal phalanges of both hands. It was less extensive on the dorsal than on the palmar aspects. After a long absence from work all these symptoms improved; the cyanosis lessened, sensation was restored, and the disagreeable invaliding subjective feelings faded away. The improvement was very gradual.

Both of these cases showed the same characteristics—acroasphyxia, venous stasis, marked terminal anæsthesia, with occasional local superficial necrosis. I believe that both patients suffered habitually from a general feeble peripheral circulation, but superadded to this was the trouble due to the specific nature of their work. Continuous exposure to cold water will, in specially predisposed persons, induce a similar syndrome, but hardly in so acute a form. Besides, both these girls had worked at "wet winding," in one case several years and in the other some time, without feeling any ill-effects. The presumption is, therefore, that the acute aggravation of the symptoms was due to the addition of a chemical to the conditioning water in which the bobbins are steeped prior to

their being brought to the winders to be wound into hanks. The chemical in these instances was potash alum, which had only recently been used. Continuous maceration in a solution of this salt tends to make the skin hard, insensitive, and leather-like.

Conditioning.

Conditioning means the artificial addition of water to cotton thread and is an accepted practice in all mills. Raw cotton contains 7·5 per cent. of natural moisture, and anything above 1 per cent. of this is called excess. During the process of spinning cotton loses about 3·5 of moisture. This loss is restored to the twist and weft in the conditioning cellar. The full bobbins of wound cotton are submerged in tanks of water about three minutes; cops, tubes, and cheeses are treated by being laid in layers in boxes and thick damp cloths are placed over them. Knots and weft bobbins are sometimes wet-sprayed.

Conditioning is used to add weight to the thread, but its most valuable property is that it increases its tensile strength. A hank is made up of 7 leas. A lea consists of 120 yards of cotton thread; if conditioned it will stand a strain of 4 lb. greater pull than undamped cotton yarn. Conditioning makes the thread thicker and less liable to fray. If excess of moisture is added (sometimes as much as 12 per cent.) the keeping properties of cotton are interfered with and mildew results. To prevent this some antiseptic is employed. Zinc chloride, sodium fluorsilicate, or other antiseptics are universally used in sizing warps for the beams in Lancashire, but this is not the process to which I refer.

In the "conditioning cellar" water is usually used alone, but in exceptional circumstances the following substances: Potash alum, about a double handful in 400 gallons of water. Zinc or magnesium sulphate 1 lb. to 100 gallons of water, which makes a solution of 1 in 1000. These last two are cleanly and effective antiseptics when sprinkled upon cops (weft), but may be injurious if the cotton has to be dyed. Sodium fluorsilicate, under the proprietary names of "Microbicide" and "Salufer" (1 lb. to 150 gallons of water is the usual strength). Formaldehyde, under the name of "Defiance Antiseptic," is a 9 per cent. solution; and "Antimildew Conditionite" is the trade name for a 13 per cent. solution of formaldehyde scented with a trace of nitrobenzene, possibly to disguise the odour of the formaldehyde. One gill of this last patent antiseptic is mixed in 30 gallons of water, forming a dilution of about 1 in 5000, forming a ½ per cent. solution.

I am informed that the continuous maceration of the hands caused by the work of handling watered bobbins *in the conditioning cellar* sets up commonly a mild chronic irritation of the first fingers and thumbs of the hands. The two girls cited above *wound* bobbins moistened by conditioning water, to which had been added potash alum, a double handful to 400 gallons of water. This chemical is used to deposit sediments in the water, and especially iron, which will readily cause iron-mould on damp threads. The bobbins these girls were working with were very wet.

Regarding the other chemicals sometimes used as antiseptics to prevent the growth of moulds, experimenting on my own forearm with a 1 in 4 solution of fluorsilicate in water, the application of a saturated cloth under jaconet in 24 hours brought out a discrete superficial pustular rash very much like the pustules caused by rubbing in croton oil. The amount of water I used did not quite dissolve the sodium fluorsilicate. There were some suspended particles, and I think the pustules were caused by their presence on the skin. The pustules varied in size from a pin's head to a small pea and were very irregularly distributed. A dilution of one part of "Defiance" antiseptic added to 5 parts of water and applied under jaconet for 48 hours to the skin of my forearm, caused here and there a diffuse erythema, which ended in a few days in desquamation.

In the conditioning cellar these chemical agents are used only in very weak solutions; but, on the other hand, it must be remembered that in the practical application of them contact with the fingers of the workers is very continuous. I think we can so far generalise as to say, that it is only in specially predisposed persons that any trouble is likely to arise, and certainly such markedly severe cases of acroasphyxia as I have described, otherwise cases would be more frequently reported.

Wigan.

SOME EXPERIMENTS WITH THE SIMPSON ARC LAMP.

BY J. H. SEQUEIRA, M.D. LOND., F.R.C.P. LOND., F.R.C.S. ENG.,

PHYSICIAN TO THE SKIN AND PHOTOTHERAPY DEPARTMENTS AT THE LONDON HOSPITAL.

THE lamp devised by Mr. Simpson is a hand-fed arc lamp, the poles of which are said to consist of wolframite. It is worked by a current of 60 to 70 volts and 5 to 7 ampères. Wolframite is a tungsten compound, and the spectra of the Simpson arc and that of tungsten have been shown by Dr. Sidney Russ[1] to be practically identical. The lamp has an open arc and its rays are reflected by a flat mirror or by a concave mirror on to the surface under treatment. When the flat mirror is used the rays are described as "open"; those which are rendered convergent by the concave mirror are called "focal."

The proper understanding of the use of concentrated actinic light in the treatment of disease is due to the late Professor Finsen. By a series of simple experiments he demonstrated that the penetration of living tissues could only be obtained by rendering them anæmic, and an essential part of the treatment to which his name is attached consists in compressing the parts subjected to light. It is the ignoring of this fact which demands close examination of the contentions urged by the exponents of the Simpson lamp.

I am convinced by a number of observations already made with the apparatus now on trial at the London Hospital that the light produced in the Simpson lamp is very rich in actinic rays. Quite early in the development of phototherapy attempts were made to devise lamps which gave more actinic radiations than the carbon arc. A successful apparatus was that invented by Mr. Leslie Miller, in which an arc was produced between iron electrodes. The light was highly actinic, and it was used with plates of ice to compress and render anæmic the area under treatment. Carbon poles with iron cores were also used in my department, and these gave highly actinic rays. There were, however, technical difficulties which

[1] Brit. Med. Jour., Jan. 22nd, 1916, p. 126.

led to the abandonment of the apparatus. The most valuable advance hitherto has been the mercury-vapour lamp of Kromayer. The actinic value of the radiations produced by incandescent mercury vapour are too well known to be insisted on here. In the Kromayer apparatus the necessity of rendering the parts anæmic is recognised, and its therapeutic value in a number of cutaneous affections is undoubted. It has been used in my clinic for years with great success, but it has not ousted the Finsen lamp in the treatment of most forms of lupus.

That radiations of high actinic value have a destructive influence on bacteria and superficial bacterial affections is well known. This fact was used on a large scale recently in the sterilisation of water for the large camp at Niagara Falls, and it is so widely known that it need not be insisted on here. It would therefore be remarkable if a light rich in actinic rays failed to affect beneficially certain superficial bacterial affections. It is claimed, however, that the Simpson lamp produces a radiation of great penetrative power, and it has been described, I presume with the authority of its exponents, in the *Times* of Jan. 10th, 1916, as "a new X ray." I venture to say emphatically that the penetrative power of the light produced in the Simpson lamp is negligible, and that the radiations have nothing in common with the X rays. I make this statement as a result of the following experiments:—

FIG. 1.

Dental films exposed to Simpson light. Three films were wrapped in paper, half of each being covered by sheet-lead 1 mm. thick. 1. The upper film was exposed to an X ray tube for half a second. The part of film uncovered by lead is black. 2. The middle film was exposed to Simpson arc for 3 minutes, open ray. 3. The lower film for 3 minutes, focal ray. The paper is in both cases as opaque to the rays as the lead.

1. An irregular hole was cut in a sheet of paper, and the paper was laid on a piece of printing out paper (P.O.P.), and exposed to the Simpson arc for three minutes at standard distance. The P.O.P. was unaffected—i.e., the rays will not pass through paper.

2. Three "dental films" used for the examination of dental cases by X rays, and consisting of a sensitised film wrapped in paper, were exposed, one half of each film being protected by a sheet of lead: (*a*) for half a second to an X ray tube at 12 inches (the half uncovered by lead was found on development to be black); (*b*) for three minutes to the open rays of the Simpson lamp at 12 inches (on being developed the film was found unaffected); (*c*) for three minutes to the focal rays of the Simpson lamp at 12 inches (on being developed the film was found unaffected). (See Fig. 1.) These experiments prove that the rays from the Simpson lamp cannot influence a sensitised film through paper, and that they are in no way comparable with the X rays.

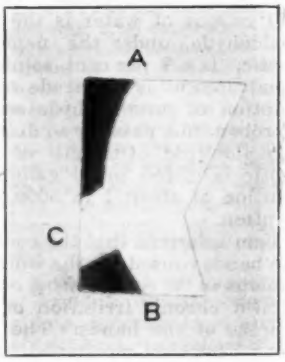
3. On examination of the arc produced by the Simpson lamp with Benoist's radio-chromometer there is no fluorescence. The radiations are not, therefore, X rays.

4. I cut out (*a*) a piece of aluminium 0·25 mm. thick, (*b*) a piece of paper, (*c*) a single layer of gutta-percha tissue, in the shape of my initials, and fastened them on my forearm with cotton wound round the limb. This was exposed for three minutes at 12 inches from the lamp at 3.30 one afternoon, and the aluminium, paper, and tissue were removed. By 6.30 P.M. an acute erythema had appeared on the forearm, bearing on it my initials in white. The light had failed to penetrate any of the material, and even the cotton threads left white lines on the skin. This proved that the rays given off excited an acute reaction but failed to penetrate aluminium, paper, a single layer of gutta-percha, and cotton thread. I have repeated the experiment, using (1) a piece of fresh human skin (taken a few minutes before from a spina bifida and kindly supplied by my colleague, Mr. A. J. Walton), (2) a piece of fresh frog's skin, and (3) a piece of paper. (Fig. 2.) The result is identical. The rays from the lamp failed to penetrate any of these tissues, while they set up an acute erythema around. Again the cotton threads used to fasten the tissues left white lines.

FIG. 2.

Photograph of the writer's forearm. On it had been fastened by cotton thread a piece of human skin just removed from a spina bifida in shape of letter J, a piece of paper shape H, and a piece of fresh frog's skin shape S. The limb was then exposed to the Simpson lamp for 3 minutes at a distance of 12 inches. The photograph was taken 36 hours later. An acute erythema was produced by the rays, but they could not pass through the pieces of human and frog's skin nor the paper; even the cotton threads left transverse white lines well seen in the photograph.

FIG. 3.



A piece of P.O.P. was strapped behind the lobule of the right ear of a boy and exposed to the Simpson arc for 3 minutes at a distance of 18 inches. The line A B is the curve of the auricle, C the piece of strapping. The dark part is the projecting part of the paper. The rays failed to pass through the lobule of the ear or the strapping.

The reaction is identical with that seen on the neck of a lady who has worn a lace blouse while exposed to strong sunlight. The pattern of the lace stands out white on the "sunburnt" area.

5. To exclude a heat-ray reaction, upon the forearm of one of the sisters in my department were fastened (1) a square piece of glass; and (2) a circular disc of rock-crystal, and the limb was exposed to the rays in the usual way. The glass entirely stopped the rays, but the rock-crystal allowed them to pass and set up an erythema. Actinic rays alone have this property.

6. Behind the lobule of the ear of a young patient I placed a piece of P.O.P. and exposed the ear to the Simpson lamp for three minutes. The P.O.P. on being developed showed that the rays would not pass through the lobule of the ear nor through the piece of strapping which fastened the P.O.P. to the auricle. (See Fig. 3.)

I therefore conclude. 1. That the rays given off by the Simpson arc are actinic rays. There is no essential difference between them and actinic rays derived from other sources of light. 2. That like other actinic rays they have no penetrative power. They will not pass through fresh human skin, frog's skin, paper, cotton, or gutta-percha tissue. 3. That they are not X rays and have nothing in common with X rays. 4. That any deep effects which have been observed are due to counter-irritation and are similar to those produced by the application of a mustard plaster or those seen from the use of light baths.

Manchester-square, W.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

COMBINED MEETING OF THE SECTIONS OF MEDICINE AND OF PHARMACOLOGY AND THERAPEUTICS.

Discussion on Trench Nephritis.

A MEETING of these sections was held on Feb. 15th, Dr. W. HALE WHITE, President of the Section of Pharmacology and Therapeutics, being in the chair.

Captain W. LANGDON BROWN, R.A.M.C. (T.F.), opened a discussion on Trench Nephritis. His paper is published in full on p. 391.

Sir WILLIAM OSLER said that the disease had not been described before with the exception of the records of the cases which occurred during the American Civil War. Its main clinical characters were those of ordinary acute nephritis, and like it it started quickly, usually without there having been any previous disorder. There were, however, certain peculiarities. The œdema was transient and usually local; general anasarca was rare. Dyspnœa was unusually prominent. Slight fever was present in a few of the cases which had returned to England, but it was probable that it was more common in the earlier stages. The rapid improvement which coincided with the disappearance of the dropsy was remarkable, and an apparent restoration to good health with persistence of the urinary changes and a high blood pressure were common. Severe uræmic symptoms had occurred without dropsy and with only high blood pressure. Cases had been admitted showing albumin with casts and blood in the urine, but without a history of dropsy, the condition being detected only by urinary examination. Although it was the rule for the cases to end in recovery, yet death occurred in not a few. Of 113 cases at Taplow, 2 ended fatally; of 30 at Paignton, 2 more; and 1 was also fatal at Oxford. It appeared that a larger proportion of deaths occurred than recent papers indicated. Post-mortem examinations had been made in 3 of these cases. In 1 case a typical large milky-white kidney had been found, identical except for the absence of injected stellate veins with the classical example described by Bright. There were no signs of fatty degeneration. In the second case acute nephritis had been superimposed on an old nephritis. In the third case the patient died from intercurrent pleuro-pneumonia. The kidneys were sclerotic, but there was also marked recent tubular and glomerular nephritis. The remaining two fatal cases were accompanied by uræmia and ended rapidly; no necropsy had been made. He feared that a considerable proportion of these cases of trench nephritis would become chronic. It was a good clinical rule that if in acute nephritis the urine did not become free from albumin by the end of the twelfth week, the probability was that the condition would become chronic. There was evidence of persistence of the nephritis among those patients at Taplow who had been ill for more than ten weeks. Nine out of 14 had a high blood pressure. In 6 of the older patients high blood pressure was accompanied by commencing arterial changes. Ten of the 14 passed urine of a low specific gravity. For these reasons he feared that many sufferers from this condition would never have a complete restoration of the functions of the kidney.

Professor F. W. ANDREWES had examined histologically specimens removed from 6 cases, the microscopical sections of which were exhibited. He had only been able to obtain one example at an early stage. In that instance sudden death had followed cerebral hæmorrhage, but the clinical evidence of a recent acute nephritis was fairly conclusive. Histologically he had found nothing indicative of acute nephritis, but only such changes as he would have expected to find in a man who had died from apoplexy. The remaining specimens were obtained from examples of typical acute nephritis, and were representative of severe trench nephritis. All showed changes in the glomeruli, tubules and interstitial tissue. In the glomeruli was the usual proliferation of the epithelium of the capsule; in the tubules degeneration and desquamation of the epithelium. Fatty changes were slight or absent. Some cellular infiltration occurred in the interstitial tissue, the infiltrating cells being chiefly leucocytes, whilst plasma cells were absent. This corresponded with the condition of the urine, from which a deposit of leucocytes was noticeable. In one case so many polymorphonuclear cells appeared in the urine that pyelitis was suspected. One case was an example of old-standing nephritis which had occurred three years previously and upon which trench nephritis had been superimposed. There was nothing histological to distinguish trench nephritis from other forms of acute and subacute nephritis. The acute glomerular nephritis of scarlet fever was comparable in all respects with trench nephritis. He had failed to find any micro-organisms in the urine or kidneys.

Mr. MACKENZIE WALLIS had carried out pathological investigations to determine, if possible, the true nature of the condition and its source of origin. He spoke of the value of estimating the diastatic output as an index to the efficiency of the renal tubules. In no disease was this so low as in renal disease. In trench nephritis there was a definite relation between the severity of the case and the diastase content of the urine. Since the ferment was excreted by the tubules its diminution in the urine of these cases indicated that the tubules were affected, and the degree of its diminution indicated the extent of the damage. The test had also value in prognosis; diastase might still be diminished in the urine after the albumin had disappeared. There was no evidence of any protein being present in the urine other than serum-albumin and serum-globulin, as in ordinary nephritis, and they were present in the usual relative proportions. The amount of albumin varied from a trace to 0·3 per cent. as estimated by Esbach's method. Microscopically, casts were constantly present, and were chiefly of the hyaline variety. There was a relative excess of white blood corpuscles, which was also characteristic of scarlatinal nephritis. In some cases there was retention of nitrogen even after the diastase excretion had returned to normal, and this had to be taken into consideration respecting the ability of the patient to return to duty. The nitrogen content of the cerebro-spinal fluid had been found to be raised when uræmia was present. Respecting the second line of inquiry as to the origin of the condition, he had first considered the possibility of a co-existing intestinal toxæmia, but had found that the ethereal sulphates in the urine were not in excess but markedly diminished. With

mineral poisoning the diastase content was also subnormal, but careful examination of the urine had failed to reveal the presence of any mineral poison. To discover a possible parasitic origin he had resorted to inoculation experiments on animals, using blood serum, cerebro-spinal fluid, and catheter specimens of urine. The urine was shown to be remarkably toxic, but the chemical characters of the toxic agent had not been determined. Apparently there was a powerful toxin circulating in the blood and excreted in the urine. He had repeated the experiments with scarlatinal nephritis, but obtained no results which were comparable. In the trench nephritis cases an illness was produced without exception on the eighth day. Two animals had died with albuminuria six days after injection, but post mortem there was no histological evidence of nephritis. Urine which had been heated to 55° C. produced no illness when injected, but an unheated filtrate did.

Captain R. G. ABERCROMBIE, R.A.M.C. (temp.), who had been working in France, had seen over 500 cases during the acute phase. In their early stages they presented the characteristics of acute nephritis of moderate severity. The most constant symptoms were headache and dyspnœa. The blood pressure showed diurnal variations of from 30 to 60 mm. of Hg, the morning reading being low and the evening high. The bouts of dyspnœa were nearly always nocturnal, and it was therefore open to question whether they were due to the rapid rise of blood pressure. At the beginning of the disease fever was present, the temperature being about 101° F. In about half of the cases there were premonitory symptoms, these in order of frequency being bronchitis, pains in the back and limbs, and abdominal pains and vomiting. Tonsillitis was exceedingly rare, but laryngitis was more common. Convulsions had occurred in 14 cases and for their treatment lumbar puncture and venesection, especially if accompanied by saline infusion, seemed valuable. Mania was met with in 4, amaurosis in 3. Fundal changes were not seen in any during the first three weeks. Two occasional associations, herpes and bilateral parotitis, supported the contention that the condition was infective in origin. A well-defined group could be separated in which the symptoms suggested pyelitis, cystitis or prostatitis. In them œdema, fever, and rise of blood pressure did not occur, but casts might, however, appear in the urine. Of some 500 cases, 4 ended fatally, 1 before the end of the first week. The kidneys in this case showed but slight macroscopic changes. Microscopically the lesion was essentially one of the tubules with some interstitial change. The spleen was enlarged and the tracheal mucous membrane granular. As regards the causation, the cases were scattered, but occurred chiefly at the front and in definite small epidemics. The men were more liable to the disease in certain areas. His own impression, based on the clinical symptoms and the characters of the epidemic, was that the disease was infective.

After Dr. W. MAIR had spoken, Captain LANGDON BROWN briefly replied.

ROENTGEN SOCIETY.

The Injurious Effects Produced by the X Rays.

A general meeting of this society was held on Feb. 1st, Mr. F. C. GARDINER, the President, being in the chair.

A discussion on the Injurious Effects Produced by the X Rays was opened by Dr. SIDNEY RUSS. After pointing out how desirable it was that this subject should be discussed by medical men, physicists, and the manufacturers of apparatus, and how the Roentgen Society provided a common ground where they could meet for this purpose, he considered that the dangers attending the use of the X rays could be classed under two heads—those to the patient from misapplication and those to the operator through being continually exposed to numerous small doses. Skill on the part of the operator obviated the former—and no one should be allowed to administer X rays without having first proved his competency to do so—while proper construction of apparatus and proper care in its use would obviate the latter. Inasmuch as the output of the modern X ray tube was about 50 times that of ten years ago, and as there was many times more X ray work done, these counted as increased dangers to the operator; on the other hand, there was no doubt that the dangers themselves were more appreciated by radiologists, who took more care in consequence, and this tended to reduce the dangers of radiological practice. As regards the injuries, there was no need to dwell on the more obvious ones, and he drew attention to the hidden dangers of X ray action, mentioning particularly the blood changes which occurred after undue exposure. He thought it was proved that the red cell content in the case of X ray operators was frequently below the normal, and in many cases the white cell content also. The diminution in certain of the white cells, however, was much more marked than in others. Some, indeed, appeared to show a marked increase under the X ray stimulus. The lymphocytes were below the normal in almost every case which had been examined.

Sir JAMES MACKENZIE DAVIDSON told the meeting that in the early days, being made aware of the baneful possibilities of the X rays, he enclosed the tube entirely in a wooden box coated on its inner side with a thick putty made up of white and red lead; a hole was cut in the lid of the box, against which the anterior part of the tube was secured by means of elastic bands. Thus the radiation was kept under control and all rays save those coming through the aperture in the lid were cut off. For screen work he had followed the plan of placing a large lead barrier around the tube, thus protecting the observer, who was enabled to watch the screen image reflected in a fine plate-glass mirror placed at the appropriate angle.

On the general question of legislative or other action, Dr. G. H. RODMAN suggested that the General Medical Council be asked to take up the matter, and make it necessary that before a man was allowed to qualify he should be as fully acquainted with the dangers of the X ray tube as he was with the dangers of strychnine.

Dr. C. FRED. BAILEY, of Brighton, said that he worked with his tube enclosed in a large lead-glass bulb, and was himself barricaded behind a large screen, so that it did not seem probable that any X rays were received directly by the operator. There remained, however, the ionisation of the air by X rays, and this was possibly dangerous to those who had to work in the X ray room for hours at a stretch.

Dr. REGINALD MORTON, while approving of the use of any protective devices that were efficient, thought there was a tendency to exaggerate the dangers of X ray practice, probably because we were occasionally confronted with the terrible injuries suffered by many of those who were the pioneers in this work. It should be remembered that there were quite as many who, like himself, had been more or less actively engaged in this way since 1895, when Roentgen announced his discovery, without suffering any inconvenience worth mentioning. While there was a certain degree of cumulativeness regarding X ray effects, it was not by any means absolute; otherwise he would not have got off so lightly, seeing that he was of necessity receiving many small doses of the rays, both primary and secondary, nearly every day of his life. The experience of Dr. Rodman showed that recovery was possible after receiving what was in his case a pronounced X ray effect. He (Dr. Morton) did not consider that secondary radiations were worth troubling about; even with the use of special devices to secure their most efficient action they were not found to have enough effect on the tissues to be of any practical value. It was the primary X rays emanating from the centre of the anticathode that were the really dangerous rays, and if reasonable precautions were taken, the risks, even here, were reduced to a very small value. The most dangerous rays were the ones most easily arrested; and, so long as the operator had never been "burnt," it was remarkable what relatively simple protective devices were sufficient. While it was quite true that electroscopes and photographic plates would be affected in any part of the X ray room even with the tube inclosed in a protective box, such tests proved no more than that there were *actinic* rays present, not necessarily rays injurious to the tissues of the operator. He wished to disclaim any intention to minimise the dangerous properties of the X rays, they were far too real for that; but he thought there was nothing to be gained by exaggerating them, and that it was just as well to look on the brighter side for a change. At the same time, unless the operator exercised common sense—which included common prudence—in this important matter, he would most likely suffer, however elaborate were his protective devices.

Dr. W. HARWOOD NUTT said that some X ray workers were returning from the seat of war with badly ulcerated arms and hands, and he himself was of opinion that no man could protect himself adequately against the danger unless the tube was protected. The ionisation effect of the atmosphere might be prevented, he thought, by efficient ventilation if two electric fans were used, one to draw air into the room, and the other to draw it out.

Dr. N. S. FINZI said that one of his assistants had placed an enclosed Sabouraud pastille on the front of his protective apron and another on the back. The pastille in front turned to the "B" tint in ten days, or a fortnight's hard work (every morning and four afternoons a week), but the pastille in the back of the apron was not more than half turned after six weeks. One pastille dose in three months did not seem likely to do the operator any harm, even if continued over a long period.

The discussion was adjourned to the next meeting.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF SURGERY.

A New Substance for Pyelography.—Aneurysm due to Bullet Wounds.

A MEETING of this section was held on Dec. 3rd, Mr. WILLIAM TAYLOR being in the chair.

Mr. A. A. MCCONNELL read a short note on a New Substance for Pyelography. He stated that he had asked Professor W. Caldwell, of the Royal College of Surgeons, Ireland, for a substitute for collargol which would be non-irritating, opaque to the X rays, and capable of flowing through a fine ureteral catheter. Professor Caldwell had made a preparation of bismuth which had not been made before, and which had these properties. The exact composition could not be given, as patent rights were being obtained. The provisional name given to the substance was "Skirol." Mr. McConnell showed several radiograms of the renal pelvis injected with skirol, and stated that he had obtained better results with this preparation than with collargol. All the skirol was washed out of the pelvis before any perceptible precipitation took place. Radiograms taken the following day showed no trace in the pelvis. In no case were there any objectionable sequelæ.

Mr. C. ARTHUR BALL read notes on two cases of Aneurysm due to Bullet Wounds. The first case was that of an officer who was wounded on April 25th, 1915, at St. Julien. Two pieces of a broken bullet entered the right thigh. After 12 or 14 days he noticed a pulsation over one of the wounds, but he was told this was only the "femoral pulse." At a medical board on July 10th, 1915, the aneurysm was discovered, although the patient himself thought he was fit for duty. At the operation the artery was exposed and a Crile's clamp applied above and below. The sac was dissected out, and as Matas's operation was not possible the artery was ligatured above and below the sac. The following morning the foot was warm, no pain was felt, and pulsation was present in the dorsalis pedis artery, so that it seemed likely the collateral circulation had been previously established. The second case was an aneurysm of the axillary artery. Private —— was wounded at Loos on Sept. 25th, 1915. The bullet entered just below the outer end of the right clavicle. X ray examination showed a comminuted fracture of the surgical neck of the humerus. The bullet lay in the thorax. The wound healed in a few days, and the limb was put in plaster-of-Paris. About three weeks later a pulsating swelling was noticed about the second and third stages of the axillary artery. When the subclavian artery was controlled the swelling diminished to about half its size. The third stage of the subclavian artery was ligatured. No alteration in the temperature of the limb was subsequently noticed. A pain which he had referred to in the hand immediately became better. The arm and hand rapidly recovered power, with the exception of the area supplied by the ulnar nerve, and this was improving. There had been no return of pulsation at the site of aneurysm, and the swelling had disappeared.

SECTION OF ANATOMY AND PHYSIOLOGY.

The Daily Food Ration of Great Britain.

A MEETING of this section was held on Jan. 14th, Dr. T. P. C. KIRKPATRICK being in the chair.

Professor W. H. THOMPSON read a paper on the Daily Food Ration of Great Britain. He said that a survey of the total food-supply of Great Britain for the year of the first census of production (1908), the only year for which it was so far possible to make anything like an accurate computation, showed the daily food-supply per man of the population, as calculated from the returns, to be as follows:—

Flour and meal	14½ oz.	Condensed milk	½ oz.
Flesh meat	8 ,,	Less than half an egg	
Fish	2 ,,	Fresh fruit	3½ ,,
Potatoes	15½ ,,	Dried fruits and nuts	½ ,,
Other vegetables	4¾ ,,	Cocoa and chocolate	1/3 ,,
Milk	⅝ pint.	Salad oil	1/10 ,,
Butter	1 oz.		
Cheese	½ ,,		

This ration provided: 101·49 grammes of protein, 587·12 grammes of carbohydrate, 136·36 grammes of fat, and gave an energy value of 4,127 calories. The returns do not, however, include all the home supply of cheese, eggs, poultry, or rabbit meat. The estimate of green vegetables consumed as human food, particularly of cabbage, is probably also too low. Making additions to cover these omissions would bring the ration up to: Protein, 104·26 grammes; carbohydrate, 587·84 grammes; fat, 138·83 grammes; energy value, 4,167 calories. As a fair estimate it would be safe to say that the British food ration per man per day does not exceed 105 grammes of protein, 590 grammes of carbohydrate, and 140 grammes of fat, with an energy value of 4190 calories. Making deductions for the loss in distribution, the value of the ration, as purchased, would approximately be: Protein, 97 grammes; carbohydrate, 345 grammes; fat, 132 grammes; energy value, 3875 calories. This did not provide more than enough for moderately hard muscular work. The ration was remarkable in the relatively large amount of fat it contained, but in this respect it corresponded closely with the estimate of the German food-supply before the war, as published by the Eltzbacher Committee.[1] Two conclusions were drawn—namely, (1) that the tendency in urban and industrial populations was to increase the consumption of fat at the expense of the protein; and (2) that the ration could not well be reduced without endangering the efficiency of the working man. Economy could, however, be introduced by substituting protein from vegetable sources for a further part of the more costly meat supply.

ULSTER MEDICAL SOCIETY.

Cancer of the Stomach.

AT a meeting of the Ulster Medical Society held in the Medical Institute, Belfast, on Feb. 10th, Dr. GARDINER ROBB, the President, being in the chair, a discussion on Cancer of the Stomach was introduced from the medical aspect by Professor J. A. LINDSAY and from the surgical by Mr. A. B. MITCHELL.

Professor LINDSAY analysed 40 cases of cancer of the stomach, 23 male and 17 female, which had been under his care in the Royal Victoria Hospital, Belfast, during the years 1902–15. Most were between the ages of 50 and 60. There was a family history of cancer in 4 and a personal history of gastric ulcer in 5 cases. The most common "signal symptom"—present in 15 cases—was painful dyspepsia, while loss of appetite was noted in only two of the cases. Pyrexia occurred in 19. On examination of the gastric contents, free HCl was absent in 71 per cent. and present in 29 per cent. In 15 cases a tumour was noticed, and enlargement of the liver was the most frequent complication. Special attention was drawn to the history and the physical signs in making the diagnosis, and where those failed time and negative results of treatment would settle the question.

Mr. MITCHELL said that cancer of the gastro-intestinal tract was a very favourable form for surgical intervention if attacked sufficiently early. When, however, palpable tumour could be made out, the disease was already in an advanced stage. The surgeon, unfortunately, rarely saw cases till the presence of a tumour made the diagnosis and prognosis alike certain. Results were steadily improving, and the operative risk might be put at from 10 to 15 per cent. Physicians

[1] THE LANCET, Feb. 20th, 1915, p. 333.

should, therefore, once they had a reasonable suspicion that cancer of the stomach was present, take their patient fully into their confidence and advise an exploratory operation. During the last three years he (Mr. Mitchell) had done six partial gastrectomies, the amount removed varying from one-half to three-quarters of the stomach, with one death; and four gastro-jejunostomies without a death, and with marked temporary benefit. The longest duration of life after gastrectomy in his own work was over five years, the patient being still alive and well. The presence of febrile temperature or of anæmia of the pernicious type were contra-indications to operation. A series of interesting specimens of resected malignant growths was shown.

Sir JOHN BYERS would apply the same principles to the upper as they did to the lower abdomen—viz., to open and look at and feel the parts directly as a means, first, of diagnosis and, secondly, of treatment. To wait until the patient made the diagnosis was simply to put off all chance of any surgical success. Once there was a suspicion of malignancy, the sooner the abdomen was opened the better.

Mr. ROBERT CAMPBELL considered the first symptom of cancer of the stomach to be a lack of desire for food, then loss of flesh, which was attributed by the patient to the anorexia. If at this period food was taken it caused no pain or dyspeptic symptom. When pyrexia and a pulse-rate of over 100 were present he thought secondary involvement of the liver had already begun. One patient of his was now alive and well, eight years after excision of a cancerous growth from the stomach, and this was the first successful case in Ireland. Another lived for five and a half years. If a patient complained of a decided dislike for food, and on examination free hydrochloric acid was absent, the surgeon should at once open the abdomen and be prepared to excise any growth discovered.

Dr. W. CALWELL agreed that loss of appetite was the first symptom. A blood examination served readily to distinguish pernicious anæmia from cancer of the stomach. In the presence of any serious stomach symptoms ordinary non-malignant disease should be eliminated by every modern method of investigation, and the surgeon then asked to explore.

Dr. W. W. D. THOMSON urged the necessity of a proper examination of the stomach contents by a skilled pathologist. The following are the signs showing when cancer had already begun: (1) Stasis of food; (2) absence of hydrochloric acid; (3) occult blood in stomach and fæces; and (4) presence of the Boas-Oppler bacillus and sarcinæ. Symptoms like those of pernicious anæmia pointed to secondary involvement of the bone medulla, as had been shown by Dr Thomas Houston, of Belfast.

Dr. M. F. CAHILL believed some cases diagnosed as cancer of the stomach were syphilitic.

Professor LINDSAY, in reply, said that the discussion had shown that operative interference must be considered most carefully in dealing with cancer of the stomach. In fairness to the physicians he pointed out that it was only within the last three years that the great progress made had justified this action.

Mr. MITCHELL stated that all the specimens he had removed from the stomach had been examined and found to be malignant. In none was there evidence of syphilis, which, in agreement with Professor Lindsay, he considered a rare disease in the stomach.

HARVEIAN SOCIETY OF LONDON.—A clinical meeting of this society was held on Feb. 3rd at the Hospital for Epilepsy and Paralysis, Maida Vale, Dr. Edmund Cautley, the President, being in the chair.—Dr. Leonard Guthrie and Dr. E. G. Fearnsides showed the following cases: 1. A soldier with Cauda Equina lesion due to shrapnel wound, having complete loss of power in the left and paresis of the right leg, the chief feature of the case being attacks of intestinal obstruction and loss of control over the bladder and rectum. 2. A man, aged 56, suffering from lesion of the Corpus Striatum, the symptoms commencing with eccentricity and suicidal tendencies, and developing into dumbness and inability to move the limbs, which were the seat of contractures. The reflexes were present, he took notice of his surroundings, but had incontinence of urine and fæces. 3 and 4. Soldiers with limitation of visual fields resulting from wounds in the parieto-occipital and occipito-mastoid regions respectively. 5. A case of Tabes Dorsalis with Charcot's knee-joint. 6. A case of Reflex Spasticity following bullet wound near the spine at the level of the tenth rib. 7. Myopathy with contractures in a woman aged 19 years. 8. Mental Amblyopia in a woman following insomnia, the optic discs being normal but fields very contracted. 9. A case of Disseminated Sclerosis sent in to the hospital as hysteria. 10. A case of Cervical Amyotrophic Lateral Sclerosis in a female aged 50 years. 11. Case of Optic Neuritis probably due to cerebral tumour.—The President and Dr. Wilfrid Dawson also showed a case of considerable Fatty Enlargement of the Legs and Arms in a young woman, the feet, hands, and the rest of the body being unaffected.

At a meeting to be held on Thursday next, Feb. 24th, at the Stafford Rooms, Titchborne-street, Edgware-road, at 8.30 P.M., Sir Berkeley Moynihan will open a discussion on the Treatment of Gunshot Wounds. Mr. D'Arcy Power, Mr. F. F. Burghard, Mr. Percy Sargent, Mr. W. H. Clayton-Greene, and Mr. A. Fleming expect to take part. The President and council cordially invite all members of the profession to be present who may be desirous of hearing the discussion.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.—The annual meeting was held on Jan. 21st at St. Mary's Hospital, Manchester, Dr. J. H. Willett, the President, being in the chair.—Mr. Carlton Oldfield (Leeds) exhibited a specimen of Retained Menses in One Half of a Double Uterus. The patient had severe abdominal pain, suggestive of appendicitis, and it was only when the abdomen was opened that it was discovered that the uterus was double, and one side much distended with retained menses owing to absence of an os on that side. The vagina did not possess a septum.—Dr. W. E Fothergill (Manchester) opened a discussion on the Notification of the So-called Puerperal Fever. It was pointed out that though Semmelweis showed before 1850 that there was no such infectious disease as "puerperal fever," the continued use of the term in the registration of deaths and under the Notification of Infectious Diseases Act had kept up the idea that such a disease existed. But though births, deaths, and marriages might be counted, it was no more possible to enumerate cases of puerperal pelvic infection than it was to enumerate cases of wound infection in general. The official figures for 1912, for example, showed that in Liverpool 78 per cent. of cases notified as puerperal fever were fatal, while in Manchester only 16·3 per cent. of the cases notified as puerperal fever died. Such a discrepancy was enough to show that the notification of so-called puerperal fever was a farce. It had never done any good, for the reduction of late years in the mortality from puerperal fever was due to the education of doctors, midwives, and the public in clean midwifery, just as the reduction of deaths from wound infection was due to clean surgery and not to notification.—The paper was discussed by Dr. Scott, Dr. A. Donald, Dr. Oldfield, Dr. W. F. Shaw, Dr. T. B. Grimsdale, and the President.—Owing to the continuance of the war it was resolved that the present officers be re-elected for the year 1916, and that no meeting of the society be held until the annual meeting in January, 1917, unless the course of events altered and made it desirable to hold one in October.

THE LATE MR. WALTER G. CARNT.—The death occurred at Ryde, Isle of Wight, on Feb. 4th, of Mr. W. G. Carnt, formerly superintendent and secretary of the Royal Infirmary, Manchester. He had been severely ailing for some considerable time before his retirement in August last. As early as 1880 Mr. Carnt obtained a clerkship in the Civil Service. In 1892 he was appointed secretary of the Derbyshire Royal Infirmary and to the corresponding office in Manchester in 1906, when the building of the new infirmary had been begun. Mr. Carnt's experience was of great value to those concerned with the erection of the infirmary itself, as well as of the central branch for accidents. He was a most devoted and resourceful superintendent, and his unstinted efforts on behalf of the infirmary were much appreciated. The annual income was more than doubled under his unrelaxing care. The board of management, on his retirement, placed on record the statement that Mr. Carnt's services had been invaluable. A memorial service was held in the Chapel of the Royal Infirmary on the day of the funeral, Feb. 8th.

Reviews and Notices of Books.

The Cancer Problem.

By WILLIAM SEAMAN BAINBRIDGE, A.M., Sc.D., M.D., Professor of Surgery, New York Polyclinic Medical School and Hospital, Surgeon and Secretary of Committee of Scientific Research, New York Skin and Cancer Hospital. New York: The Macmillan Company. Pp. 533. Price 17*s.* net.

THE problem of cancer is always with us. We know nothing for certain as to its exact etiology, and though surgery can accomplish much if the case is seen early, we have no satisfactory treatment for those cases in which surgery is not available. The matter is of great importance, for the number of patients suffering from cancer seems definitely to be increasing, and the whole of this increase cannot be explained away by greater accuracy of diagnosis and record. The literature of the subject is voluminous, and it is practically impossible for anyone who has but a limited amount of time to devote to the subject to cover all that is known as to the mode of production, the histopathology and the various methods of treatment which have been employed. There is certainly, therefore, a need for a work which will put together in one volume the gist of all that is known of the matter, so that medical men and even laymen desirous of learning the present position of this subject will be able in a reasonable time to ascertain the essential part of what is known about cancer. This difficult task has been accomplished in a successful manner by Dr. Bainbridge.

He starts with a brief account of the history of the disease, and he then describes the establishment of institutions in various countries for the study of cancer. The next section is devoted to the distribution of the disease in plants and animals, and in the various parts of the world. Especially good is the chapter on the very difficult subject of the statistics of cancer. As to its etiology, the author concludes by saying that though much light has been thrown recently on certain predisposing factors in the production of cancer, "the essential cause is yet to be discovered." Other chapters deal with the histopathology, with cancer research, the clinical course, the prophylaxis, "cancer cures," and treatment, both surgical and non-surgical. One chapter deals with institutions for the care of cancer patients, and one with the campaign of education.

The book is of great interest and is well put together. It must have involved an immensity of labour to gather together all the information contained, and we can hardly speak too highly of the way in which the author has carried out the task he set himself.

The Primary Lung Focus of Tuberculosis in Children.

By Dr. ANTHON GHON, Professor of Pathological Anatomy at the German University in Prague. Authorised translation by D. BARTY KING, M.A., M.D. Edin., M.R.C.P. Lond. and Edin., Assistant Physician to the Royal Hospital for Diseases of the Chest, London. With 72 text illustrations, and one black and one coloured plate. London: J. and A. Churchill. 1916. Pp. 180. Price 10*s.* 6*d.* net.

IN this book, which here receives adequate translation, we have an illuminating investigation into the mysteries of that isolated lung focus familiar to all those who conduct necropsies on tuberculous infants and children. First noted by Parrot, carefully described by Küss in 1898, and studied on a large material by H. Albrecht in 1909, it here receives its crowning notice at the hands of Professor Anthon Ghon. Confining himself to 184 cases of tuberculosis, in which the whole investigation was personally conducted, he found the "primary lung focus" in 170 or 92·4 per cent., but in 14 cases (7·6 per cent.) it was not discovered. Of these 14 cases 5 showed tuberculosis of other organs, and in 2 others which gave a positive tuberculin test, no macroscopical tubercle was found at necropsy. In the remaining 7, which were all cases of tuberculosis of chest glands, it remained open to conjecture whether tubercle bacilli had reached the glands through the lung tissue without the production of a lesion, or whether a lung focus really existed but failed to be discovered. In some of Ghon's cases the focus was only found after a search of several hours over many days. In every case the corresponding lymphatic glands were diseased, and this fact furnished a key to the location of the focus. The lung focus itself was either caseous, or formed a cavity, or was calcified. In 55 per cent. of the cases the focus was "active," which is not surprising, since most of the cases were infants in the first year of life. In dimensions it was commonly pea-sized, but where cavitation existed was often larger; it was more frequent in the upper lobes and on the right side. Of particular interest is the frequency with which pleurisy of more or less extent was found over the focus—in no less than 95 among 142 cases with a single focus. Finally, by a process of exclusion, Ghon shows the primary lung focus to be, in all probability, of aerogenous origin.

This work, although of purely pathological scope, presents points of great interest alike to clinician and hygienist. The primary lung focus is a subclinical phenomenon—save, perhaps, for Hamburger's insistence on the universal occurrence of cough in infants at the period of tubercle invasion—yet its association with pleurisy brings it directly into touch with the experiences of practical medicine. It must be noted that Ghon's work disturbs no views as to the spread of tuberculosis at its later and clinical stages. The first stage of tuberculosis for the clinician is the pathologist's second stage—namely, the glandular disease secondary to this lung focus. It is the clinician's second, the pathologist's third stage, which is most familiar to the practising physician—namely, the stage at which disease has spread out from the glands again into the lung, a process commonly attributed to a retro-impulsion of lymph. These stages Ghon's work leaves undisturbed. To the fact that Ghon's material shows over 95 per cent. infected through the respiratory tract the hygienist may properly object that post-mortem statistics are not applicable to the living, and that living infected children would by no means necessarily show an inhalation tuberculosis in anything like so high a proportion.

Surgical Anæsthesia.

By BELLAMY GARDNER, M.R.C.S., L.R.C.P. Lond. With 8 plates and 36 figures. Second edition. London: Baillière, Tindall, and Cox. 1916. Pp. 220. Price 7*s.* 6*d.*

THIS manual has been much improved in appearance in its second edition. The print is larger, and by the increased size of page more material has been included without thickening the book. Thus

chapters dealing with intratracheal insufflation, spinal analgesia, and Crile's system of anoci-association have been added, composed mainly of extracts from the writings of those responsible for the introduction of these newer methods, and Mr. Gardner has ventured little upon criticism of their efficiency or desirability. The chapters upon shock and upon the treatment of emergencies are also, we think, a little meagre, and for the purposes of the student and practitioner these might with advantage have been increased at the expense of the very interesting chapter on the history of anæsthetics. This chapter, indeed, is the most complete of all in the book and is likely to remain long of value to anyone compiling a work upon anæsthesia.

Pathological Technique: A Practical Manual for Workers in Pathological Histology and Bacteriology, including Directions for the Performance of Autopsies and for Clinical Diagnosis by Laboratory Methods.

By FRANK BURR MALLORY, A.M., M.D., Associate Professor of Pathology, Harvard University Medical School; Pathologist to Boston City Hospital; and JAMES HOMER WRIGHT, A.M., M.D., S.D., Pathologist to the Massachusetts General Hospital; Assistant Professor of Pathology, Harvard University Medical School. Sixth edition, revised and enlarged, with 174 illustrations. London and Philadelphia: W. B. Saunders Company. 1915. Pp. 536. Price 13*s.* net.

A WORK that has been before the medical public for nearly a score of years can scarcely need the assistance of commendatory notice from the reviewer to ensure a continuance of its success. Four years ago[1] we reviewed the fifth edition of this useful work. Two years ago the edition being exhausted, it was reprinted as it stood, but now, again revised and again enlarged (by the addition of some 30 pages and a dozen new illustrations), it comes before us for notice once more. On previous occasions we have dealt with the book as a whole, and with the exception of the few instances where our own opinion has not coincided with that expressed by the authors we have marked our appreciation of the success with which the authors have carried out their self-imposed labours in no uncertain manner. On the present occasion it only remains for us to refer to the added matter. The most important addition (pp. 237–245) outlines the main facts in connexion with the better known pathogenic blastomycetes and hyphomycetes. Seven excellent photographs and some semi-diagrammatic sketches which are inserted in this section convey a very clear impression of the morphology of Sporotrichum schenckii and the appearance of the cells found in dermatitis coccidioides.

The description of the technique for obtaining blood during life for cultivation purposes from cases of suspected bacteræmia has undergone some expansion to include McJunkin's tube, which is figured, but which we venture to believe has few, if any, advantages over an ordinary all-glass antitoxin syringe and sterile citrate or oxalate solution, in preventing clotting. Bensley's method for the demonstration of mitochondria is given in full, whilst the undoubtedly superior Herxheimer's alcohol acetone solution of scharlach R. is now recommended in place of the saturated solution in 70 per cent. alcohol in previous editions. Important additions are the complement-fixation test for gonococcus infections and the similar test for hydatid disease, although in the last mentioned the worker is not warned of the fact that not every cyst fluid nor every alcoholic extract of cyst will yield a workable antigen. As a final quibble, may we suggest that to the British eye "pipet" looks unnatural?

[1] THE LANCET, Jan. 27th, 1912, p. 236.

Rural Sanitation in the Tropics.

By MALCOLM WATSON, M.D., C.M. Glasg., D.P.H. With 56 illustrations. London: John Murray. 1915. Pp. 320. Price 12*s.* net.

THIS is a most interesting book, and one which inculcates many useful lessons on the subject of rural sanitation in the tropics. It contains the personal experiences of the author in the Federated Malay States, along with an account of visits to Panama, British Guiana, and Sumatra, where marked progress had been made in dealing with malaria and other tropical diseases by modern methods. The first half of the book describes the sanitary circumstances of the Panama Canal Zone, which the author calls the "Mecca of the modern sanitarian," and the measures taken to eradicate yellow fever and other insect-borne diseases in that region. The steps taken in the Malay Peninsula to improve health conditions are noted, especially at Klang and Port Swettenham, where successful attempts, among the earliest of the kind, were made under his direction to reduce malaria on the lines formulated by Sir Ronald Ross, to whom the volume is dedicated. Description is given of the conditions under which coolies live in the Dutch plantations of Sumatra. The question of malaria in Italy, India, the Straits Settlements, Ceylon, Hong-Kong, and the Philippine Islands is fully discussed. In a final chapter the author furnishes an "epilogue" on the place of sanitation in tropical colonisation.

Dr. Watson was formerly one of the medical officers in the service of the Government of the Federated Malay States, and acquired a considerable reputation as a sound and trustworthy adviser. His efforts to ameliorate the health of the coolies on the plantations attracted attention, and he became adviser to an association of leading planters in Malaya on the best means of improving the health of the labourers on their estates. As a result of his efforts death and sickness rates were greatly reduced and much useless jungle turned into wealth-bearing plantations. When in 1911 a malaria advisory board was constituted for the Federated Malay States he was appointed one of its medical members. A desire to broaden his views and sense of responsibility for the health and efficiency of the large force of tropical labourers under his charge led him to visit other lands to see what was being done in tropical sanitation on modern lines. The results of these travels are presented in his book, which all interested in the suppression of malaria and other tropical diseases should carefully study. Dr. Watson found the rôle of a sanitarian in the tropics one of deep interest, and the lessons he draws in his book can hardly fail to excite a similar enthusiasm in some of his readers and a desire to go and do likewise.

JOURNALS AND MAGAZINES.

The Monthly Bulletin of the International Office of Public Hygiene. (Office International d'Hygiène Publique crée à Paris par l'arrangement international du 9 Decembre, 1907. Bulletin Mensuel.) Paris: 195 Boulevard Saint-Germain. Price 10 francs per annum, postage included.—This journal is rendered more than usually interesting by its regular consideration of questions made topical by the war. The menace to the whole European community

created by the unwholesomeness of the battlefields of the trench warfare, and the prevalence of epidemic typhus fever among some of the armies engaged are the two principal topics discussed in recent issues, and it is quite clear that these are matters with which no nation can deal single-handed. We in this country depend just as much on what our allies, indeed to some extent on what our enemies, are doing as on the precautions we ourselves are able to apply, and the international character of such matters is apparent. We have no battlefields in England, but epidemics connected with the disposal of the killed, with the exposure of bodies lying in places where they cannot be reached for removal and burial, may spread to our shores. The *Bulletin* brings to our notice debates in the French Academy of Sciences on the contamination of subsoil waters through the hasty burial of the dead in the nearest convenient spot. The December number deals with the whole question of the danger of thus contaminating the water-supply of large towns, notably of Paris. It has been found necessary to remove some of the dead to more suitable burial grounds, and it is easy to realise that we have here a very serious sanitary problem.

In regard to typhus, it is useful to have a record of what the nations that are situated between us and the epidemic centres are doing. The *Bulletin* publishes the text of the new French and Italian laws and regulations, prepared and issued since the grave Serbian epidemic of typhus rendered the application of such rigorous precautions necessary. The French and Italian regulations do not trust in the least to the technical knowledge of those who have to see to their practical application. Everything is minutely and clearly explained, so that a functionary, or be it a simple attendant, would know just what ought to be done. The main thing is to kill the lice and to prevent anyone, whether in good health or a patient, entering a hospital or any other inhabited place when there are still any vermin on his person, clothes, or belongings. It may be interesting to note that, though the object in view is identical, the method of procedure varies somewhat. The French instructions which were issued by the Minister of the Interior on May 31st, 1915, stipulate that the receiving, examining, and cleansing room should stand apart from any hospital, huts or main building. It should be provided with the most powerful light available, should be constantly washed with hot water containing 5 per cent. of carbonate of soda, and occasionally fumigated by burning 20 grammes of sulphur for every cubic metre of space. Naturally the attendants must be protected by overalls tightly fastened round the ankles, wrists, and neck. Such portions of the skin that still remain exposed must be rubbed with an ointment of petrol, xylol, camphor, or turpentine, so as to keep the parasites away. But the process differs in dealing with the clothes as they are removed from the lice-infected person. According to the French regulations, these, including boots and hats, should be placed in a metallic box and sprayed with 40 to 50 c.c. of benzene. The lid is then fastened down, and after 15 to 20 minutes the lice are either killed or so stupefied as to be inoffensive, and the clothes can then be handled and washed without danger. The rules issued by the Italian Minister of the Interior are dated June 24th, 1915, and are as carefully explained and elaborate as the French. But there are differences in matters of detail. Thus, we have the suggestion that one or two large newspapers should be placed on the floor and that clothes should be removed gently so as not to shake off the lice. But as some are nevertheless likely to fall off, the newspapers on which they fall could be rolled up and burnt. All clothes that would not be injured by the process are to be at once immersed in boiling water, and other objects placed in a waterproof sack or metallic box and conveyed to the disinfecting stove. Doubtless all this can be done at Bari, Brindisi, and other places where fugitives and others coming from the Balkans may land, but it is to be feared that the necessary accommodation may not always be forthcoming. However this may be, the *Bulletin* does help in making known from the international standpoint what are the difficulties that have to be overcome.

Archives of Radiology and Electrotherapy (Archives of the Roentgen Ray).—This journal continues to maintain its usual high standard in spite of the fact that many sources of contributions are cut off by the crisis from which the world is suffering. Formerly there were contributions from most continental countries, but under necessity British writers are rising to the occasion. In the number for December, 1915, Dr. George Ward gives an interesting paper on the value of the electro-cardiograph in the diagnosis of diseases of the heart, as a result of his extensive work at the Middlesex Hospital. The paper is fully illustrated with a series of tracings which add very materially to the worth of an already valuable and important communication.—Dr. J. M. Woodburn Morison's paper on gas in the tissues shows by excellent radiographs how the presence and distribution of gas can be demonstrated in the vicinity of wounds by shell and other missiles used in war. Its presence can be shown frequently before being discovered by other methods, and the importance of this is obvious to those who have had to deal with such wounds as this war has furnished in prodigious numbers.—Professor H. Bordier, of Lyons, describes how the alternating current from the main can be best used for the treatment of many of the cases of neuritis and muscular atrophy that are so common in military hospitals. He controls the current with what he calls the "chloroform bottle rheostat," a simple and efficient appliance that can be improvised by anyone and at any time.—The number for January, 1916, opens with a paper by Mr. Archibald McKendrick on the radiography of normal parts, which is evidently meant for beginners.—Dr. Hugh Walsham and Dr. Walker Overend record investigations on the movements of the colon. This contribution is of greater importance than may at first sight appear, for it is encumbered with many unfamiliar, and perhaps improvised, terms. The following sentence from the authors' conclusions will explain our criticism: "With regard to the two functional variations from the average progression of the opaque meal, the tachykinetic modification may be due to an increase in the number and the amplitude of the megadiastaltic waves (vago-pelvic hypertonia) and probably associated with a reduction of anastalsis." This is one of the more simple sentences, and such free use of unfamiliar words makes the study of the article unnecessarily tedious.—We note a new departure in the institution of an inquiry column, which should be of great value in a branch of medical research that is in its early and most busy stages of development. This, with sections devoted to reviews and notes and abstracts, makes the journal one of great value to radiologists. With regard to the illustrations, they do not appear to be up to the previous standard.

CORNWALL COUNTY ASYLUM.—The medical superintendent in his annual report for 1915 states that on Jan. 1st there were 1039 patients (496 males and 543 females) in the institution. During the year 49 males and 59 females had been discharged, and 52 males and 77 females had died. Of the 108 patients discharged, 71 were recovered, 31 relieved, and 6 not improved. The recovery rate was 37·15.

LITERARY INTELLIGENCE.—Messrs. H. K. Lewis and Co., Limited, announce the following books for early publication:—"Localisation by Röntgen Rays and Stereoscopy," by Sir James Mackenzie Davidson, illustrated with stereoscopic and other pictures. "The Pathology of Tumours," by Dr. E. H. Kettle. With 126 illustrations from original drawings and photographic material. A new volume of essays by Dr. T. B. Scott (author of "The Road to a Healthy Old Age") entitled "Modern Medicine and Some Modern Remedies," to which Sir Lauder Brunton has contributed a preface. "Notes on Galvanism and Faradism," by Dr. Magill, with 66 illustrations, intended for masseuses and those employed in the practical administration of electrical treatment. "The Adolescent Period: Its Features and Management," by Dr. Louis Starr. A new edition (the fourth) of "Mentally Deficient Children," by Dr. G. E. Shuttleworth and Dr. W. A. Potts; this has been revised and in part rewritten, while the illustrations have been increased. A new (seventh) edition of Gould's well-known "Pocket Medical Dictionary," containing an additional 1000 words (35,000) is also just ready. A new and revised edition of Binnie's "Operative Surgery" will be published, it is expected, in March. A small book by Dr. C. Russ on "A New Treatment for Gonorrhœa" is also nearly ready. A thoroughly revised and greatly enlarged edition of Dr. Herbert Tilley's "Diseases of the Nose and Throat" is in the press.

A MONTHLY RECORD OF ATMOSPHERIC POLLUTION.

COMMITTEE FOR THE INVESTIGATION OF ATMOSPHERIC POLLUTION:

Summary of Reports for Month ending August 31st, 1915.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre during month.								
		Insoluble matter.			Soluble matter.		Total solids.	Included in soluble matter.		
		Tar.	Carbonaceous other than tar.	Ash.	Loss on ignition.	Ash.		Sulphate as (SO_4).	Chlorine (Cl).	Ammonia (NH_3).
ENGLAND—										
Birmingham, Central [1]	51	—	—	—	—	—	—	—	—	—
,, Aston	49	0·05	1·47	5·68	0 90	3·40	11 50	1·80	0·20	0 03
,, S.W.	35	0·02	0·51	1·17	0·40	1·60	3·70	0 80	0·10	0·02
Bolton	139	0·03	3·45	3·11	4·44	7·22	18 25	4·73	1·11	0·06
Exeter	48	0·02	1·14	2·62	1·34	1·90	7·02	0·67	0·25	0·02
Kingston-upon-Hull	46	0·14	2·57	2·97	1·48	3·34	10·50	1·89	0·21	0·05
Leicester	49	0·04	2·24	3·16	2·16	1·57	9 18	1 35	0·27	0·09
Liverpool	139	0·19	3·10	6·23	0·27	6·94	16·73	4·62	0·59	0·25
London—										
Meteorological Office	85	0·05	0·70	3·78	1·71	4·43	10 67	1·79	0·60	Nil.
Embankment Gardens	78	0·18	3·43	6·22	1·56	4·37	15·76	2·44	3·05	0·16
Finsbury Park	42	0·15	1·47	5·58	0·66	2 75	10 61	1·34	0·24	0·01
Ravenscourt Park	91	0·04	1·01	2·23	1·29	2·33	6·90	1·66	0·32	0 08
Southwark Park	70	0·21	2·73	5·76	0·84	4·76	14·30	2·41	0·45	0·10
Wandsworth Common	40	0·05	0·43	1·65	0·89	1·61	4·63	1·14	1·28	0·43
Victoria Park	68	0·18	3·08	4·87	1·49	3·24	12·86	1·87	0·45	0·09
Golden Lane	64	0·09	3·18	5·12	1·55	2·83	12·74	1·33	0·43	0·11
Manchester—										
Ancoats Hospital [2]	—	—	—	—	—	—	—	—	—	—
Bowdon	106	0·01	0·47	0·92	2·32	30·43	34·15	2·04	0·43	0·03
Cheadle	75	0·06	1·39	1·82	0·71	2·61	6·59	2·04	0·35	0·05
Davyhulme	91	0·02	0·91	2·87	1·38	6·12	11·30	3·42	0 40	0·05
Fallowfield	74	0·63	1·02	24·08	6·50	42·22	74·45	25·87	0·29	0·62
Moss-side	62	0·16	1·38	4 44	0·60	4·69	11·27	3·23	0·53	0·08
Phillips Park	82	0·08	2·36	9·93	1·18	7·38	20·93	2·11	0·89	0·04
Queen's Park	104	0·09	1·39	5·64	1·50	7·15	15·77	4·94	0·69	0·05
School of Technology	73	0 13	2·76	7·80	1·40	4·58	16 67	3·35	0 65	0·08
Whitefield [3]	—	—	—	—	—	—	—	—	—	—
Newcastle-on-Tyne [4]	—	—	—	—	—	—	—	—	—	—
Oldham	119	0 14	2·69	3·95	0·95	6 21	13·94	2·56	0·68	0·12
York	34	0·06	0·96	2·26	0·87	1·08	5·24	0 82	0·17	0·06
SCOTLAND—										
Coatbridge	64	0·13	2·44	6·46	1·20	2·29	12·52	1·64	0·30	0·10
Greenock	48	0·03	3·02	5·41	1·13	1·83	11·42	1·19	0·09	0·07
Leith	119	0·06	1·25	3·66	4·30	4·30	13·57	1 62	0·31	0·05

[1] Gauge tampered with; results unreliable. [2] Building operations in vicinity; results vitiated. [3] No returns sent in. [4] No returns; gauge removed temporarily.

"Tar" includes all matter insoluble in water but soluble in CS_2. "Carbonaceous" includes all combustible matter insoluble in water and in CS_2. "Insoluble ash" includes all earthy matter, fuel, ash, &c. One metric ton per sq. kilometre is equivalent to: (*a*) Approx. 9lb. per acre; (*b*) 2·56 English tons per sq. mile; (*c*) one gramme per sq. metre; (*d*) 1/1000 millimetre of rainfall.

The public health authorities concerned in the supervision of these examinations were as follows: Dr. J Robertson, Medical Officer of Health of Birmingham; Dr. J. E. Gould, Medical Officer of Health of Bolton; Mr. H. Lloyd Parry, Town Clerk, Exeter; Mr. A. R. Tankard, Public Analyst, Kingston-upon-Hull; C. K. Millard, D Sc, Leicester; Dr. E. W. Hope, Medical Officer of Health of Liverpool; The Director of THE LANCET Laboratory, Meteorological Office, London; Mr. J. Ollis, Chief Officer, Public Control Department, London County Council, London; Dr. W. J. Howarth, Medical Officer of Health of London; Mr. W. Osborne Thorpe, Engineer, Urban District Council, Malvern; Mr. J. Warrington, Secretary, Air Pollution Advisory Board, Manchester; Dr. J. B. Wilkinson, Medical Officer of Health of Oldham; Dr. H. Kerr, Medical Officer of Health of Newcastle-on-Tyne; Professor W. P. Wynne, The University, Sheffield; Dr. E. M. Smith, Medical Officer of Health of York; Mr. A. G. Dutch, Sanitary Inspector, Coatbridge; Mr. J. Devine, Sanitary Inspector, Greenock; Mr. Thomas Bishop, Sanitary Inspector, Leith; and Mr. W. W. Kelso, Sanitary Inspector, Paisley.

The analytical work involved in these returns was undertaken respectively by J. F. Liverseege, F.I.C., Birmingham; Harry Hurst, B.Sc., F.I.C., Bolton; F. Southerden, B.Sc., F.I.C., Exeter; A. R. Tankard, F.I.C., Kingston-upon-Hull; S. F. Burford, Leicester; W. H. Roberts, M.Sc., F.I.C., Liverpool; S. A. Vasey, F.I.C., Director, THE LANCET Laboratory (London Meteorological Office collections); J. H. Coste, F.I.C. (Embankment Gardens, Finsbury Park, Ravenscourt Park, Southwark Park, Wandsworth Common, Victoria Park collections), London; F. L. Teed, D.Sc., Golden-lane, London, E.C.; C. C. Duncan, F.I.C., Malvern; E. Knecht, Ph.D., M.Sc., Manchester collections; J. T. Dunn, D.Sc., Newcastle-on-Tyne; Samuel Urmson, Oldham; Professor W. P. Wynne, Sheffield collections; S. H. Davies, M.Sc., York; Messrs. R. R. Tatlock and Thomson, Coatbridge; J. W. Biggart, F.I.C., Greenock; A. Scott Dodd, B.Sc., F.I.C., Leith and Paisley.

New Inventions.

THE TELEPHONE PROBE.

IN February, 1915, I described at a meeting of the Medical Society of London a probe and a pair of spring forceps which would give an audible signal when they came in contact with metallic fragments in a wound. I have since had some opportunities of perfecting these instruments. When the probe meets a metallic foreign body an unmistakable buzz takes place, due to a short circuit. Unlike the telephone probe, this signal is continuous so long as the probe is in contact with the foreign body. The telephone probe merely gives warning on making and breaking contact with a metallic object. A specially devised pair of bullet forceps can be passed down the probe, using the latter as a guide, and will grasp any foreign body with which the probe is in contact. I believe, however, that the spring forceps are proving to be the more valuable, inasmuch as they act as probe and forceps combined. The blades are prevented from completely closing by a small stop. When the blades come in contact with the metallic foreign body the signal is given, then if the foreign body is successfully grasped by the forceps the signal is continuous. These forceps are proving invaluable for small fragments of shell, such as are continually met with in military hospitals.

The probe and forceps, which are easily sterilisable, are made by Messrs. Down Brothers, St. Thomas's-street, London, S.E.

EDWARD W. H. SHENTON,
Senior Surgical Radiographer to Guy's Hospital.
Harley-street, W.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 19, 1916.

Medical Men and Civilian Needs.

WE have laid stress week after week upon the absolute need that the navy and army should be supplied with medical men promptly and freely, but we have never closed our eyes to the wants of the civilian population. In certain circumstances we have stated that the claims of the fighting forces must be regarded as paramount, but it is, of course, perfectly clear that the well-being of both the navy and the army is in great measure dependent upon the good health of the population at home, from whom the sailors and soldiers receive the supply of material necessary for the carrying on of the war, and to whom they must look for all the arrangements outside the actual fighting. Exactly where civilian interests, from the medical point of view, must be subordinated either to supposed military demands or to efforts towards economy in public affairs is, however, a very difficult point to decide. At a recent meeting of the Worcestershire Insurance Committee, the Committee learned with mixed feelings that one of their medical officers proposed to join the Royal Army Medical Corps, hoping to obtain a substitute to discharge his medical duties. The Committee, uncertain what their position would be in regard to the substitute, communicated with the Insurance Commissioners, and received a reply which may have puzzled them. They were told that there was at the present moment an ample supply of medical men to meet the needs of the civil population, only the supply was badly distributed. The statement is perfectly true, but, unfortunately, its contradiction is implied in the difficulty admitted by the reservation. A man is potentially, but not at all conveniently rich who has a cheque which he cannot cash; and while the country may still be said to possess a fair quantity of medical men, a quantity from which the demands of the services can be freely met, it is quite impossible to mobilise the men in such a way as to get full value from them. A system under which medical men could migrate from places where they are in excess to places where they are in a deficiency would be ideal, and it is towards some such plan that it will prove necessary to turn if the difficulties of medical service grow more acute; but the simple question of rent makes such a solution of the problem one which can only be applied with great foresight and with a sound pecuniary backing.

Before the needs in any large way of one locality can be met by the immigration of medical men from another locality, it is necessary that there should be rigid economy practised in the employment of the civilian doctor. The public is only beginning to understand what this means, and to appreciate the troubles that may arise in Insurance Committees if the panel doctor departs abruptly from the sphere of his duties. Very few of the panel practitioners, as far as we know, have actually left their practices without attempting to find substitutes, but over the substitutes the Committees possess only a vicarious authority, and it is natural that the Insurance Commissioners should watch anxiously the depletion of their medical staff. In one district of England the Education Committee have proposed to drop for the duration of the war the work of medical inspection, though continuing dental treatment. The Board of Education did not approve of the proposal, although it implied economy of medical labour. If the Board of Education had viewed the proposal differently, and such an example had been followed in any large sort, the freeing of a certain number of medical men suited to take commissions in the Royal Army Medical Corps would have followed; but the educational authorities were not prepared to acquiesce in any serious and systematic curtailing of the medical activities specially connected with their work. We cannot help sympathising with the attitude of the Board of Education. For this is a time when the physique of the young should be jealously guarded and when the largest possible proportion of our youth should be placed in a position to benefit fully by the national provision for their education. For, indeed, many of our failures in the conduct of this war have been due to our standards of education, and to the want of logical thinking. The action taken by the Education Committee in question ended in a compromise, for it was resolved to drop medical inspection of the intermediate group between the entrants and leavers, and to make the entrants the subjects of a general survey from which deductions might be made in respect of the conditions requiring immediate remedy. The Committee openly resented the attitude of the Board of Education towards their attempts at economy and this is not surprising; but we can well see that the Board cannot allow an important section of the work done under its ægis to be suddenly suspended without, at any rate, taking pains to ascertain whether an alternative course is open.

The Local Government Board is compelled equally with the National Insurance Commissioners and the Board of Education to watch in the public interests lest the health of the country should suffer from the scarcity of medical men. Outbreaks of measles have been reported from many places recently. At the end of January there were a dozen schools at least closed at Nottingham, which, in common with other large centres in the Midlands has been visited by an epidemic of this troublesome and dangerous disease during the last months. At Bristol the medical officer has presented a special report showing that during the first three weeks

of the year the average weekly notifications of measles had been 351, and he included in his report a keen criticism of the procedure of notification in regard to measles, finding it to impose upon the community an expensive obligation of little value at a time when economy is imperative. Exactly the same attitude has been taken by the Health Committee of the Portsmouth Town Council. At Melton Mowbray a sharp little epidemic of measles has been reported, and though it has now abated it is quite clear that from these localities medical men cannot be easily spared. But the Board of Education, like the Local Government Board and the National Health Commission, will assuredly have to go short of medical assistance to the extent which may be demanded by the needs of the navy or army. It is the duty of the public, recognising this, to take every opportunity of being sparing of the time and work of medical men, so that those who remain in civilian employ may be able to discharge their increased duties with satisfaction to themselves and their employers.

While we are very anxious to see the demands of the navy and army met with promptitude by the medical profession, there can be no doubt that the position of those who accept commissions will in some circumstances be a distinctly precarious one. To some of our colleagues it must appear that the sacrifice that they are asked to make when joining the Royal Army Medical Corps, is out of all proportion great. Medical practitioners in large cities and medical centres often incur heavy responsibilities which are justified by the solid and increasing success which reaches them at the prime of life. It is no wonder that they should regard sudden service with the Royal Army Medical Corps as a form of bankruptcy. Their pay may meet but a fraction of the expenses which they will be compelled to leave behind them as still current, while the substantial position which justified them in their large commitments will be jeopardised by their absence. It is only natural that medical men in this position, keenly anxious though they be to help their country in the war, should ask with persistence the question whether more civilian medical men are required, and whether the Central Medical War Committee is justified in using the terms of urgency employed in its public communications. The situation of these medical men is only too well recognised by the Central Medical War Committee, who rely on information from the War Office to the effect that more civilian medical men, and in large quantity, must be recruited. The Committee will certainly take such steps as they can to mitigate the circumstances in which a large number of general practitioners are finding themselves, and their all-round familiarity with a many-sided problem should enable them to be very helpful in cases of hardship. If the medical profession had been mobilised as a whole in the first stages of the war, with a view to using the time and talents of each and all of us to the best advantage, a good many of the existing hardships would not have arisen. But this step was not taken, and it is difficult to blame the military authorities for not having foreseen the necessity or the prudence of a step whose advantages escaped the attention of the doctors themselves. We think it is late in the day to attempt this mobilisation now, and in face of the existing situation the scheme of enrolment promoted by the Central Medical War Committee affords the best opportunity by which medical men of military age can obtain fair treatment. But its fairness is proportional to its universal adoption.

A New Commentary on Harvey.

IN common with all writers of the first rank, HARVEY is interpreted aright only by those who bring to their studies fruitful knowledge of the conditions under which his work was done. To be successful a commentator must be able, as far as possible, to reach the standpoint of his author, and this may not be easy in the absence of full data. Thus a new RABELAIS lives to-day by the researches of the Société des Études Rabelaisiennes—his environment and past blend to make a picture that it was not possible to paint 25 years ago. Few men have been more carefully studied than HARVEY. For 250 years orators of the Royal College of Physicians of London have done justice to various aspects of his life, and seemed to have exhausted in a somewhat monotonous manner the lessons of his work. It appeared impossible to present anything new about him or to colour anything old with new tints. We were wrong in this belief. In a monograph of under 250 pages, entitled "Harvey's Views on the Use of the Circulation of the Blood," the late Professor JOHN G. CURTIS, of Columbia College, has, in the words of his editor FREDERIC S. LEE, "presented a more profound study of HARVEY'S ideas and comparison of them with the more important of HARVEY'S predecessors than has heretofore appeared"—a strong statement fully borne out by the substance of the book. Twice before have Americans made notable contributions to Harveian literature: J. REDMAN COXE, in 1834, wrote a learned monograph against HARVEY'S claims; while in by far the best story of the circulation of the blood JOHN C. DALTON effectually met every possible argument against the priority of the great Englishman's demonstration. A pupil and successor of DALTON in the chair of physiology at the College of Physicians and Surgeons affiliated to Columbia University, CURTIS was known to be one of the most learned men in the profession, well versed in ARISTOTLE and in GALEN, and delighting in the works of the fathers of physiology. There was about him the aloofness of the scholar, and his students and colleagues were apt to criticise the reticence of his learning. This little volume is their answer. Nothing more illustrative of the very best scholarship has ever come from the profession in America.

The key to HARVEY'S position CURTIS finds in a study of the great master ARISTOTLE. PAYNE in his Harveian Oration suggested that "the relations of HARVEY to ARISTOTLE would be an interesting study." For more than 2000 years the body had been held to feed itself tranquilly out of the vessels in a way fitly expressed by the old simile of irrigation ditches in a garden—a simile which ARISTOTLE and GALEN borrowed from PLATO. The very first criticism HARVEY had to meet from his opponents was that the phenomenon which he had postulated would serve no purpose. The motion he had proven was so swift and the quantity passing through the heart so large that, as he confessed, it seemed a much larger quantity than would suffice for the nutrition of the body. That the new view clarified the old doctrine of the absorption of food was clear, but HARVEY failed to get beyond ARISTOTLE and GALEN in the relation of the circulation to respiration, which he regarded as a process of cooling and ventilation. In his remarkable demonstration SERVETUS, among other changes, had noted the change in the colour of the blood after passing through the lungs, and suggested that by respiration the blood was freed of fuliginous matters; but it remained for JOHN MAYOW, already an undergraduate at Oxford before HARVEY'S death, to grasp the true significance of the function. By the straining of the blood through the lungs the blood became florid and thinner, but HARVEY stumbled over the question of the absorption of air or spirits into it, though 19 centuries previously his great master, speaking of the channels from the heart, said: "It is by contact they receive the breath and transmit it to the heart." CURTIS puts very clearly the relation of REALDUS COLUMBUS to the much-discussed question of the discovery of the circulation. This is important in view of the claims of our Italian colleagues which are set forth ably in LUCIANI'S "Text-book of Physiology," now so popular among students in its English dress. LUCIANI indicates how erroneous it is "to speak of the pulmonary transit, as COLUMBUS had set it forth ..... as though COLUMBUS were in some sort a sharer in the discovery of the circulation. Those who so speak fail to note the difference between blood and *the* blood. Although COLUMBUS girded at GALEN and corrected him, COLUMBUS'S pulmonary transit of a fraction of the blood by curing more than one defect of the Galenic doctrine strengthened the erroneous Galenic physiology of the blood movement. Of these larger features COLUMBUS was not only no enemy, but remained a devoted adherent. His doctrine certainly paved the way for HARVEY'S, but in no more immediate sense than did GALEN'S doctrine that blood is naturally contained in the arteries."

ARISTOTLE knew nothing of a circulation, but he maintained a primacy of the heart for both the venous and arterial systems. For GALEN, as for HIPPOCRATES, the blood had a dual source: "Root of the veins, the liver; root of the arteries, the heart"; and difficulty was found in convincing anatomists that the circulation had not a hepatic but a cardiac origin. VESAL in 1539, in the famous "Tabulæ Sex" has a plate of the liver giving origin to the veins. CURTIS shows how admirably HARVEY restored the sovereignty of the heart, as maintained by ARISTOTLE: "The heart is the governor everywhere, like the chief in a commonwealth with whom is lodged the first and highest authority." Those who opposed HARVEY longest and most bitterly were the Galenists whose system he attacked and shattered. He even apologises for his old friend and opponent RIOLAN, saying "it was proper that the dean of the College of Paris should keep the medicine of GALEN in repair."

Not without some doubts did HARVEY maintain the views of his master in the primacy of the heart. Unfortunately, we have only a part of his life's work, but in his old age his friends at the College induced him to publish the "De Generatione Animalium," in which we find that years of careful research had taken him beyond the point of view of his master, and he advocates the primacy of the blood: "The blood is made before the leaping-point is formed, and the blood is endowed with vital heat before it is set in motion by pulsation." As the primal abode of the innate heat, the blood is responsible for the heart beat, as seething into the ventricles from the auricles it stimulates their walls to contract. These chapters on the primacy of the blood and the cause of the heart best illustrate the good use Professor CURTIS has made of a first-hand study of ARISTOTLE. After all, HARVEY'S great discovery was the reversal of the direction of the venous flow, and he knew that the main cause of the return is the forcible emptying of the ventricles into the arteries. He recognised, too, the help of the muscles, but many points were missed, waiting the microscope of MALPIGHI and the hydraulics of STEPHEN HALES. Students of HARVEY will appreciate the able way in which the American author reveals the great physiologist as a link between the old and new, not simply as an innovator. The final chapters on the Blood the Seat of the Soul, and on the Innate Heat show how well HARVEY had recked his own rede, when he told the young man, "Goe to the fountain head and read ARISTOTLE." And this scholarly contribution to the history of physiology, with its wealth of notes, carries the same lesson.

TESTIMONIAL TO DR. JOSEPH POWER, ARDFINNAN.—A meeting of medical practitioners of the south-east of Ireland was recently held in Waterford for the purpose of promoting a testimonial to Dr. Joseph Power, of Ardfinnan, co. Tipperary. Dr. Power has been very active on behalf of the profession in the recent struggle over certification under the National Health Insurance Act, and for the past year he has been vice-chairman of the Irish Medical Committee. He was author of a pamphlet entitled "Facts about Irish Doctors and the Insurance Act," which was efficacious in gaining the support for the profession of many influential laymen and public bodies. Dr. J. W. H. Jellett, 11, Beresford-street, Waterford, is honorary treasurer of the Fund. Subscriptions are limited to one guinea.

Annotations.

"Ne quid nimis."

THE NUMBERS OF MEDICAL STUDENTS.

THE following is a summary of the returns from the various schools of medicine dealing with the number of medical students who joined our ranks in 1915. The summary has been received from the General Medical Council, and is dated January, 1916:—

—	England and Wales.			Scotland.	Ireland.	Total.	
	London	Provinces.	Total.				
(a) Number of *First Year* medical students enrolled in 1915	359	384	743	693	499	1935*	
Number out of (a) who were *women* students	118	80	198	182	76	456	
Number out of (a) who were *foreign* or *colonial* students	64	25	89	57	12	158	1055
Number out of (a) who were *under 18* on admission	66	99	165	170	106	441	
(b) Number out of (a) who were in *actual attendance* in January, 1916	279	320	599	550	477	1626	
(c) Number of *Second Year* students who were in *actual attendance* in January, 1916.	200	197	397	357	266	1020	

* Number registered by the General Medical Council in 1915 was 1918. Number of unregistered students in medical schools was 17 at least.

The registrars, deans, and other officers of schools of medicine and approved scientific institutions throughout the United Kingdom must view the number of medical students actually engaged in their work as sadly small, but a large diminution of the names added annually, on the average, to the Medical Register must be anticipated for several years.

PREVENTION OF INFECTIOUS DISEASE: A SCHOOL CODE.

THE position of a medical officer to a public school is one of grave responsibility. The aggregation together of a number of young persons, who before entering on school life have been shielded from infection, forms an explosive mixture the introduction into which of a single spark of infection may be followed by disastrous results. Even the mild non-lethal infections, which in ordinary family life may be practically ignored, when introduced into a large school may disorganise and paralyse the whole work of the term. Stringent precautions are therefore necessary to guard against the danger, and the school medical officer needs to be invested with the most absolute authority. It is in the nature of things, under these circumstances, that rules must be arbitrary; the possibility of friction between headmaster, parents, and school doctor is therefore great, and would be gravely intensified if wide divergences of practice existed as between the several schools. A standard authority is consequently a necessity and is supplied by the well-known Code of Rules[1] of which the seventh edition is now published. It is necessary that arbitrary rules should be carefully scrutinised with due regard to the hardships which may be inflicted upon individuals and the period of five years which has elapsed since the publication of the previous edition cannot be said to be too short. The rapid increase in knowledge of the infectious diseases which the progress of bacteriology has effected has considerably modified the practice of dealing with contacts in some instances, and for the arbitrary period of 12 days for the quarantining of a diphtheria contact a rule based upon bacteriological examination is now substituted. It is significant of a certain change of opinion in regard to the mode of transmission of infection that the word "contagious," which in addition to "infectious" for 30 years appeared in the title, has now been discarded. The data relating to isolation of the infected and the table of incubation and quarantine are given in a separate leaflet appended to the rules as follows:—

Isolation of the Infected.

Varicella (Chicken-pox).—Until every primary scab has fallen off, particular attention being paid to the scalp.

Diphtheria.—In no case for less than four weeks, and until convalescence is completed, so that there is no longer any sore-throat, or any abnormal discharge from the throat, nose, ears, or eyes, no cutaneous pustulation and no albuminuria, and that at least two successive bacteriological examinations of the pharyngeal and nasal mucus for the specific bacillus made at intervals of not less than two days have been attended with negative results; each examination having been made not less than three hours after the discontinuance of local antiseptic applications.

Rubella (German Measles) and *Epidemic Roseola* (Rose Rash).—For not less than seven days from the date of the appearance of the rash, provided there is no persistence of nasal or other symptoms.

Morbilli (Measles).—For not less than two weeks from the date of the appearance of the rash, convalescence being satisfactorily established.

Mumps.—For not less than two weeks from the commencement, provided that one clear week has elapsed since the complete subsidence of all swelling.

Scarlatina (Scarlet Fever).—For not less than four weeks from the date of the appearance of the rash, provided convalescence is completed, and there is no sore-throat, discharge from the ear or nose, suppurating or recently enlarged glands, or eczematous patches.

Variola (Small-pox).—Until every scab has fallen off, and the skin lesions have all healed.

Pertussis (Whooping-cough).—Until the characteristic spasmodic cough and the whooping have ceased for at least two weeks; or in cases of persistent whooping in not less than six weeks from the commencement of the spasmodic cough.

Table of Incubation and Quarantine.

	Incubation.	Quarantine.
Varicella (Chicken-pox)	11–19	20 days.
Diphtheria	2–10	—*
Rubella (German Measles)	9–18	20 days.
Epidemic Roseola (Rose Rash) ...	9–18	20 ,,
Morbilli (Measles)	10–14	16 ,,
Mumps	14–23	24 ,,
Scarlatina (Scarlet Fever)	2– 8	10 ,,
Variola (Small-pox)	10–14	16 ,,
Whooping-cough	7–19	21 ,,

* When a bacteriological examination of the throat and nasal mucus has been carried out with negative results on three successive occasions at intervals of two days: no antiseptic applications having been made to the throat and nose for at least three hours before taking the swab.

In many instances the rules with regard to length of time a patient is to be considered infectious have been modified and, it is interesting to note, in each case in the direction of shortening the period. In view of the responsible decisions which must frequently be made by them, a copy of the most recent edition of the Code of Rules should be in the hands not only of every school medical officer but also of every headmaster of a private or preparatory school.

[1] A Code of Rules for the Prevention of Infectious Diseases in Schools. Issued by the Medical Officers of Schools Association. Seventh edition. London: J. and A. Churchill. Pp. 66. Price 1*s.* net.

THE SLEEPING SICKNESS CAMPAIGN IN THE ISLAND OF PRINCIPE.

SLEEPING sickness has for many years ravaged the fair island of Principe, a Portuguese possession situated in the Gulf of Guinea, about 150 miles off the West Coast of Africa. Several medical commissions have been sent to try to eradicate the disease during the last few years. In THE LANCET of Jan. 10th, 1914, we made some comments on an interim report by Surgeon-Captain Bruto da Costa, who gave an account of what had been done up to May, 1913. The final report of the last medical commission has now been published,[1] and the results achieved are highly creditable to those concerned. It is estimated that from 1902 to 1913 about 210 persons died annually from sleeping sickness in a population averaging during that period about 3800. The natives of the island, who are notoriously idle and apathetic, form only about a tenth of the whole population, the other nine-tenths including imported African contract labourers from San Thomé and other places along with the planters, the officials, and their families. The main industry is the cultivation of the cacao plant. In 1911 the campaign for exterminating the glossina palpalis fly was commenced with a staff of 43 men, all of them being prisoners of war or criminals sentenced to penal servitude; but gradually the number of this force was increased till, in 1914, it comprised 316 members. The chief steps taken were the clearing away of herbaceous and bushy vegetation, opening out and exposing to the sun's rays the margins of water-courses and swamps, straightening and levelling the banks and beds of streams, draining and filling up swamps, and felling forest trees on a considerable scale. While these measures destroyed the haunts and breeding places of the tsetse flies, active steps were likewise taken to trap the glossinæ by means of Maldonado's method (described in THE LANCET of Feb. 12th, 1910) with cloths smeared with a sticky substance which attracted the flies and to which they adhered; these cloths were worn by members of the sanitary brigade during the day, and at night the glossinæ were picked off and burned after being counted. In this way at first as many as 1500 to 2000 flies could be caught in a day. Altogether 469,311 glossina palpalis flies were killed from 1911 to 1914. The yearly catch was as follows: 203,629 in 1911, 197,323 in 1912, 68,322 in 1913, and only 34 in 1914. Attempts were made to destroy all animals likely to act as reservoirs of the virus and on which the tsetse flies could feed, including wild pigs, of which about 3500 were killed, stray dogs, of which nearly 2000 were destroyed, and "lagaias," or civet cats, of which also about 2000 were slain. Although there was no evidence against monkeys as affording food to the glossinæ, they were also hunted down, as they cause considerable damage in the cacao plantations; field rats, too, were exterminated as far as possible. By a Government regulation every person known to have been bitten by a glossina palpalis fly had to be injected with a dose of atoxyl without delay. Blood examinations were systematically made to detect persons who were carrying trypanosomes in their blood, and hospital accommodation was provided for isolating in screened wards those ill of, or suspected to be suffering from, sleeping sickness. These measures have proved eminently successful, and in 1914 the percentage of persons examined whose blood was found to be infected had fallen from 7·7 in 1913 to 0·64 in 1914, the same rate for 1911 having been 18·5, and for 1907 26·0. During the last five months of 1914 no glossinæ were caught, though they were carefully sought for. Attention is now being devoted to improvement of the sanitary conditions in the island and the housing of the African labourers. The circumstances of the contract worker have been greatly improved, and the cultivated parts of the land considerably extended. The cost of the campaign has been divided between the planters and the Colonial Government. The success of these efforts was no doubt helped, in part, by the insular position of Principe, preventing reimportation of fresh glossinæ from the mainland. But the medical mission may well feel proud of their achievements which have resulted in practically freeing the island from the scourge of sleeping sickness.

[1] Sleeping Sickness, a Record of Four Years War against it in the Island of Principe. By B. F. Bruto da Costa, J. F. Sant' Anna, A. C. dos Santos and M. G. de Araujo Alvares. Translated by Lieutenant-Colonel J. A. Wyllie, I.M.S. (retired). Published for the Centro Colonial, Lisbon, by Baillière, Tindall, and Cox, London, 1916. Pp. 272, with 70 plain and 5 coloured plates and 3 maps. Price 7s. 6d. net.

THE OPEN-AIR TREATMENT OF PNEUMONIA AND BLOOD DISORDERS IN CHILDREN.

IN the *American Journal of the Medical Sciences* for January Dr. R. G. Freeman has recorded remarkable results from the open-air treatment of pneumonia and blood disorders in children. Pneumonia of infancy he regards as a disease of housing. It has little tendency to develop in summer, and rarely occurs in winter among children kept in the open air. Open air he finds a more efficient remedy than any drug, serum, or vaccine, and bronchitis and croup are no contraindications to its use. At the Roosevelt Hospital, New York, the other conditions in children which he has found most benefited by open air are tuberculosis, anæmia, chorea, marasmus, and convalescence from any disease. In pneumonia the routine treatment is to give an initial dose of castor oil, put the patients to bed on the roof (which is partly covered and enclosed on the north, east, and west side), and keep their extremities warm by means of ample bedclothes and hot-water bottles. Very seldom is any stimulant or expectorant given. In uncomplicated cases of lobar pneumonia the mortality was only 4·7 per cent., and in uncomplicated cases of broncho-pneumonia 3·3 per cent. In the former the average course after admission was three days and in the latter seven days. But it was in blood disorders that the most interesting results were obtained. A poorly nourished child, aged 13 months, was admitted with bronchitis, gastro-enteritis, and marked simple anæmia. The hæmoglobin was only 22 per cent., the red corpuscles numbered 2,840,000 and the white 7700, and there was moderate poikilocytosis and anisocytosis. The child was placed on the roof and given seven drops of syrup of the iodide of iron thrice daily. Improvement was very rapid, and the temperature reached normal in a week. After four weeks the hæmoglobin was 45 per cent. and the red cells numbered 5,030,000. A coloured child, aged 3 years, had von Jaksch's anæmia in a marked form. There were headache, a large spleen, and a temperature of 102° F. Blood examination showed hæmoglobin 17·5 per cent., red corpuscles 1,368,000, white 41,000, polynuclears 74 per cent., lymphocytes 26 per cent., some megaloblasts, anisocytosis, and poikilocytosis. After a fortnight of open-air treatment the hæmoglobin had risen to 40 per cent. and the red corpuscles to

3,500,000, while the white had fallen to nearly normal and the abnormal form of red corpuscles had almost disappeared. After three months she was so well that she was discharged, but the spleen remained enlarged. A child, aged 4 years, had leukæmia. The lymphatic glands all over the body were enlarged. The liver and spleen were much enlarged, the latter extending 7½ inches below the ribs. Blood examination showed red corpuscles 2,000,000, white 158,400, anisocytosis, and poikilocytosis. There was pneumonia of practically the whole left lung. The child was placed on the roof and the white corpuscles dropped in 24 hours to 15,000. The general appearance improved and colour returned to the cheeks. The pneumonia cleared up, and after a fortnight the lymphatic glands had diminished in size and the spleen extended only 4½ inches below the ribs, the number of leucocytes was normal, and the blood was improved in other respects. The child was then put into a ward, which was well ventilated. After four days the lymphatic glands and spleen were as large as before and the leucocytes numbered 90,000. The child was, therefore, put back on the roof and improved again. The value of open-air treatment of pneumonia is, of course, now well recognised, but these cases of blood disorders are obviously too few for general conclusions, though they are very suggestive.

THE FUNCTION OF THE PITUITARY BODY.

Two of the Hunterian lectures last week, delivered at the Royal College of Surgeons of England, dealt with the surgery of the pituitary fossa. Professor V. Zachary Cope discussed the normal and pathological anatomy and the surgical approach in man. To this subject we hope to return later. Professor W. Blair Bell dealt with experimental operations on the pituitary body in animals, basing his conclusions on his own extensive experimental work. The first extirpation of the pituitary body was performed in 1886 by Sir Victor Horsley, and the matter was carried to a further stage by Paulesco and Harvey Cushing. The results reached by the two latter experimenters were briefly these. Removal of the whole of the pituitary body or of its anterior lobe causes death in a short time. Partial removal of the anterior lobe produces the condition known as dystrophia adiposo-genitalis. Removal of the posterior lobe gives rise to no symptoms. Professor Blair Bell's experience covered 27 operations on dogs of which only one died as the result of the operative interference, contrasting favourably in this respect with preceding instances. A detailed description of the surgical method is to appear in the *Quarterly Journal of Experimental Physiology*, and need not detain us here. We need only say that with the technique adopted the operation only occupied about half an hour, and in every case the animal recovered sufficiently in two hours to drink milk and was able to eat meat on the following day. The control animals in which, with the same operative interference, the pituitary body was not removed, lived for many months. Professor Blair Bell's conclusions confirmed those of his predecessors with one very important exception. He also finds that complete removal of the whole body or of the anterior lobe is always fatal. The dog recovers from the operation, but remains in a state of somnolence from which it can be roused for about 24 hours, when breathing gradually becomes slower and stops. Incomplete removal of the anterior lobe insufficient to give rise to fatal coma results in a condition of genital atrophy. The Graafian follicles die, the interstitial cells of the ovary disappear, the muscle of the uterus atrophies, and the glands drop out. Paulesco and Cushing described the same condition without illustrating it. Professor Blair Bell demonstrated on the screen comparative sections of uterus and ovary before and after the removal, the before specimens having been obtained from the same animal at a preliminary operation. So far he was in agreement with others. Cushing, however, went on to state that partial removal of the anterior lobe gave rise to the condition of dystrophia. Professor Blair Bell had never seen this result from any removal of pituitary substance, but observed it as a constant sequel of complete separation of the pituitary body from the brain by crushing or section. One animal increased 66 per cent. in weight in 50 days, and its uterus and ovary were found completely atrophied, while the thyroid vesicles were distended with colloid. Finally, removal of the posterior lobe produced no symptoms whatsoever. The health of the animal remained unimpaired, the ovary and uterus were normal, and continued to develop in the young animal. A further series of experiments illustrated the effect of the pressure of a tumour on the pituitary body. The tumour in this case was a ball of wax impregnated with barium salt so as to be visible on the X ray plate. Where this local pressure is successfully applied the animal wastes, becomes irritable, and develops glycosuria without other evidence of pressure on the brain. Cushing recognised a definite type of cachexia, but Professor Blair Bell found a condition typical in general of a dog suffering from a wasting disease. In the light of his own observations the lecturer had been led to regard the function of the pituitary body as that of the organ as a whole; the secretory material comes from the intermediary cells which are themselves derived from the anterior lobe, and these cells and their products invade the posterior lobe, or pars nervosa, when the gland is active. The lecture was lucid in itself and copiously illustrated by convincing lantern slides.

THE FIXATION OF SALVARSAN AND NEOSALVARSAN BY THE BLOOD AFTER INTRAVENOUS INJECTION.

AN interesting paper bearing on the fate of salvarsan and neosalvarsan in the organism when injected intravenously appears in the December number of the *Bio-chemical Journal*. The author, Mr. William John Young, of the Australian Institute of Tropical Medicine, Townsville, refers to the experiments of Breinl and Nierenstein, who found that when serum was shaken with atoxyl, and the proteins subsequently precipitated from the mixture with tannic acid, the precipitate invariably contained arsenic which could not be removed by washing. In each case in which arsenic was present in the tannic acid precipitate the "atoxyl serum" could not be freed from arsenic by continued dialysis. The experiments described by Mr. Young were performed to ascertain whether similar combinations could be obtained with salvarsan and neosalvarsan. The results are of interest as throwing some light on the pharmacology of these organic combinations of arsenic. It was shown that after injections of salvarsan and neosalvarsan

some arsenic is bound to the serum proteins in a form which cannot be removed by dialysis. The subjects experimented upon were goats, and the serum from these, after intravenous injection of salvarsan and neosalvarsan, proved to contain arsenic in a form which cannot be separated from the proteins by dialysis, and which is precipitated with the serum proteins by tannic acid. Accordingly it is concluded that salvarsan and neosalvarsan behave in a similar manner to atoxyl. It is important to note that no such combination is obtained when inorganic arsenic is injected. The combined arsenic is found in the blood long after all free salvarsan and neosalvarsan have been eliminated. The combined arsenic the author found in the plasma and in the red blood cells, but no trace of arsenic is retained in the fibrin.

A SAFETY X RAY TUBE.

IN the *Scientific American* Supplement of Dec. 18th, 1915, is a description of a novel form of X ray tube, designed by Professor Dr. L. Zehnder, of Zürich, the object of which is to allow no X rays to escape except through a small window opposite the focal point of the anticathode. The body of the tube is a length of metal, on one end of which is mounted the cathode, from which it is disconnected electrically by an elaborate system of insulation. To the opposite end is fixed the anticathode, which is in metallic contact with the body of the tube, and the latter is grounded in use. The anticathode can be raised or lowered by suitable screw devices, and inclined relatively to the longitudinal axis of the tube, but it is not stated how the vacuum of the tube is maintained under these conditions. The window is made of glass or aluminium, and can be controlled by diaphragms or fitted with filters as may be required. There is also fitted a regeneration chamber for regulation of the vacuum. If this construction proves practicable it will be a great boon to radiologists by virtue of the absence of the wide field of active radiation that is characteristic of tubes in ordinary use, though there is danger from the secondary radiations of the wall of the tube, though very much less than from the direct rays. It is stated that this tube makes it possible to obtain very hard rays, such as are now only obtainable from radium, that it is safe to handle at all times, easy to carry off the heat produced, and by the adjusting anticathode the focus can be altered to suit all radiological purposes. Only by further experience can the validity of these claims be established; the departure from standard design is a very great one, and we look forward with interest to some further details of actual work.

A MEDICAL QUADRUPLE ENTENTE.

IN a letter addressed by Dr. G. Bardet, director of the laboratory of the École Pratique des Hautes Études in Paris, to Sir Dyce Duckworth, upon which we have been invited to comment, our French colleague laments the invasion of France by medical, surgical, and laboratory products of German origin and the almost complete absence of instruments and even books of English and Italian origin. Dr. Bardet ascribes this unsatisfactory state of affairs in part to the negligence of English manufacturers and publishers, stating that although in receipt every year of numerous catalogues of German opticians and German publishers, he has not received for 25 years a single English list. He announces his intention, therefore, to organise a committee of French savants in order to make an *amicale propagande* among the allied nations. The first step in this direction has now been taken and a committee formed from the editorial staff of the medical and scientific press of France, whose names we give as an indication of the influential nature of the movement.

M. Arnozan, *Journal de Médecine de Bordeaux*; M. Bourquelot, *Journal de Pharmacie et de Chimie*; M. Gilbert, *Paris Médical*; M. Landouzy, *Presse Médicale*; M. Langlois, *Revue Générale des Sciences*; M. Moureu, *Revue Scientifique*; M. Ed. Perrier, *Association des Écrivains Scientifiques*; M. Quénu, *Revue de Chirurgie*; M. Albert Robin, *Syndicat de la Presse*; M. Bardet, *Bulletin de Thérapeutique*; M. Fiessinger, *Journal des Praticiens*; M. Janicot, *Bulletin Médical*; M. Lyonet, *Lyon Médical*.

An extensive programme has now been drawn up by this committee, the *Comité médical, national et inter Alliés* which is to educate the buyer to practise a voluntary abstention from products and apparatus of German origin, at the same time indicating a source of supply among the allied nations. The committee assumes that the supply of these products will follow upon the demand for them. Sir Dyce Duckworth, to whom we are indebted for communications with Dr. Bardet, considers that the views so clearly set forth by Dr. Bardet are already taking root in this country, the present war being a call to all of us to develop our various industries in a worthy manner.

A REPORT has just been issued by the Medical Research Committee, which has been made by the Special Advisory Committee of that body, upon the bacteriological studies of cerebro-spinal fever carried out during the epidemic of 1915. The advisory committee consists of Professor F. W. Andrewes, F.R.S., Captain, R.A.M.C. (T.), Professor William Bulloch, F.R.S., and Professor R. T. Hewlett, and their report gives a coördinated view of the experiences gained in different localities throughout the country during the epidemic. It will be a valuable guide both for future research and for the practical control of cerebro-spinal fever among the military forces.

WE regret to announce the death, which occurred in Edinburgh on Tuesday last, of Sir William Turner, the famous anatomist, Principal and Vice-Chancellor of the University of Edinburgh, and formerly President of the General Medical Council.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

THE WEEK'S SUBSCRIPTIONS.

THE subscriptions to the Belgian Doctors' and Pharmacists' Relief Fund received during the week have been as follows:—

	£	s.	d.
Dr. R. D. H. Carpenter (tenth donation, total £10)	1	0	0
B. M. A., British Guiana Branch, Members and others (second donation) (per Dr. G. S. Craig, honorary secretary)—			
Dr. Downer	1	0	10
Dr. MacAdam	1	0	10
Dr. Irving	1	0	10
Dr. Mackinnon	1	0	0
Dr. Barnes	1	0	10
Dr. Kennard...	1	0	0
Dr. Pereira	1	0	0
Dr. Ramdeholl	1	0	0
Dr. Campbell	1	0	0
Dr. Wills	1	0	0

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham-gate, London, S.W., and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

A BRIEF ACCOUNT OF

A METHOD OF PROVIDING BATHS FOR THE SOLDIER IN THE FIELD.

BY H. NORMAN GOODE, M.B.LOND., F.R.C.S.EDIN., D.P.H.,
CAPTAIN, R.A.M.C. (T.)

CLEANLINESS, as is well known to those who have been in the trenches, is a matter of the greatest difficulty under the present conditions. Men have to remain in the trenches without any opportunity of washing or changing their clothes. In consequence they get covered with lice, chiefly pediculi vestimentorum. These cause great irritation, and rob them of sleep when off duty. The lice inhabit chiefly the shirt, pants, and trousers, in which millions of eggs are laid in a very short space of time. To alleviate this arrangements are now made throughout the British army for the men to have baths and a change of underclothing as soon as they come out of the trenches. The following is the method adopted by a certain division.

I will first give a description together with a plan of the baths themselves, then the routine of bathing the men, and, lastly, the method I have devised, in conjunction with Captain Basil Hughes, of Bradford, for purifying and using the water over again an indefinite number of times.

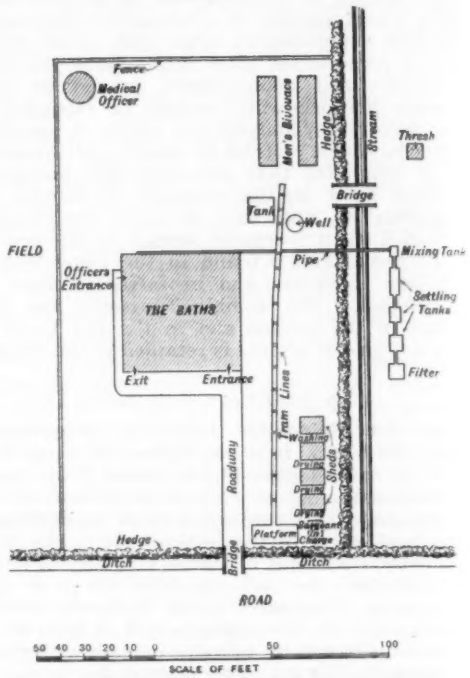
Description and Plan of Baths.

As regards the building itself, a perspective view and ground plan are subjoined. (Figs. 1 and 2.) The canvas structure, with which I originally commenced, has now been replaced by a portable wooden building. This was kindly presented by the West Riding of York County Association through the instrumentality of Lord Scarbrough and General Mends.

From the ground plan it will be seen that it consists of a large undressing-room, a bath-room with eight "showers," the officers' shower bath, a large dressing-room, a room for soiled underclothing, a store-room for the issue of clean clothing, a boiler-room, and an ironing-room for the purpose of destroying the eggs and lice in the khaki clothing. (Fig. 3.)

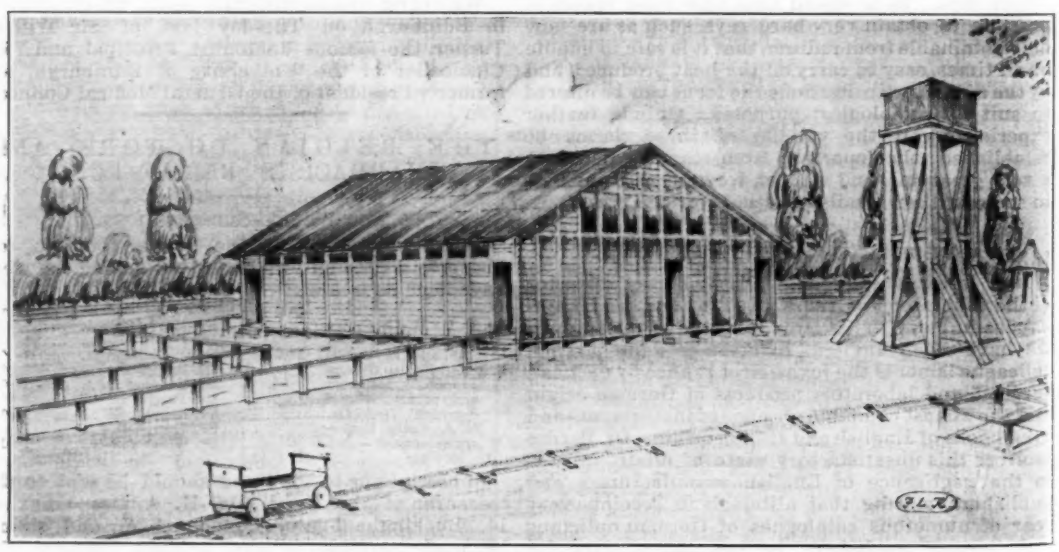
The water is pumped by means of a little petrol engine into a sixteen-hundred-gallon tank, 24 feet high; thence it runs by gravity to the two connected tanks which feed the boilers, which are independent of one another. The water—hot, cold, or mixed hot and cold—feeds the eight sprays by gravity, sprays being used to economise water.

FIG. 2.



Ground plan of the bathing installation.

FIG. 1.



A perspective view of the bathing installation.

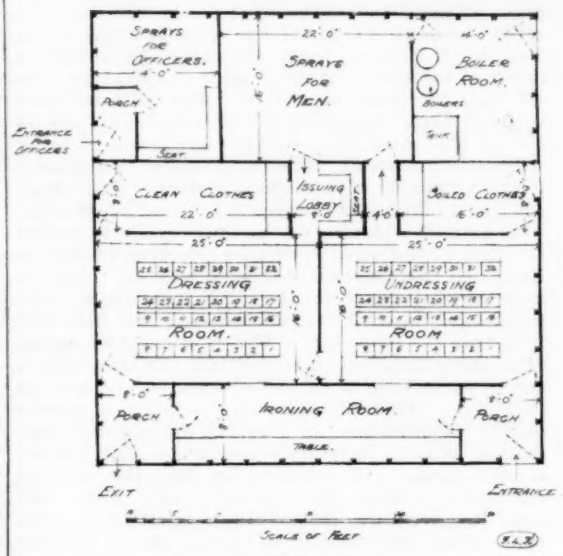
since only one-and-a-half to two gallons are required per man, instead of six when using tubs. (Fig. 4.) Originally every drop of water had to be carried to the baths by means of a motor tank holding 120 gallons from a stream about one-and-a-half miles away, as, for convenience of the troops, the baths had to be placed in a field some way from the nearest brook. Now, however, there are three sources: a shallow well providing about a thousand gallons a day; a storage tank, containing water brought from the stream and rain-water from the roof; and the concrete well, containing the purified used water. The process of purifying the used water I will describe later. These three sources are connected up to the motor pump. Thus any one may be used separately to supply the elevated storage tank.

Method of Bathing.

The method employed for bathing the men is as follows: Two thousand men can be bathed per diem. The maximum in one day, so far, has been 2050. The men are sent to the baths in batches of from 50 to 75 every half-hour, commencing at 8 A.M. and continuing until 12 noon; then again from 2 P.M. to 6 P.M. The men come to the baths without arms as a rule. Here they undo their puttees and boots and take off their tunics. They then enter the undressing room in batches of 32, and undress. Their breeches are then handed into the ironing room, where they are ironed in order to kill the lice and nits. The trousers are usually put through the Thresh disinfector. The men, in batches of 16, then pass through to the sprays, handing in to the soiled-clothes room their shirts, socks, and pants. Three minutes is the usual time allowed under the hot sprays, during which time they soap themselves all over, the last half-minute being used to wash off all the soap. In the summer the last half-minute consists of a cold "shower." Thence they go into the dressing room, being served out on the way with a clean shirt, a pair of pants, and a pair of socks. Meanwhile an attendant has brought round their boots, tunics, and other belongings from the undressing room to the dressing room, placing them on a number corresponding with that from which they were taken, the numbers being painted on the tables. When dressed they leave by the exit door and form up outside, another batch of 16 immediately following through in the same order.

Thus it will be seen that the underclothes are pooled. The shirts and pants are put through the Thresh disinfector in lots of 80 for 20 to 30 minutes at a temperature of 216° F. Twenty minutes suffice if a bottle of formalin has been poured into the disinfector. The clothes are sorted and the unserviceable portion is burnt. The following morning the rest of the clothes are conveyed in wagons to a distributing centre in a village eight miles away. This is the nearest available place where spring water abounds and where labour is obtainable away from the firing line. Here a responsible woman sorts and distributes the clothing to 50 washerwomen, who boil, wash, dry, iron, and mend them, and then return them tied up in bundles of 10 to the distributing centre. The same wagons, after being washed with cresol solution, return to the baths with loads of clean clothes, each batch of clothes being returned on the third day. Several thousands of new shirts, pants, and socks are required monthly to replace wastage.

FIG. 3.



Ground plan of the bath-room.

FIG. 4.

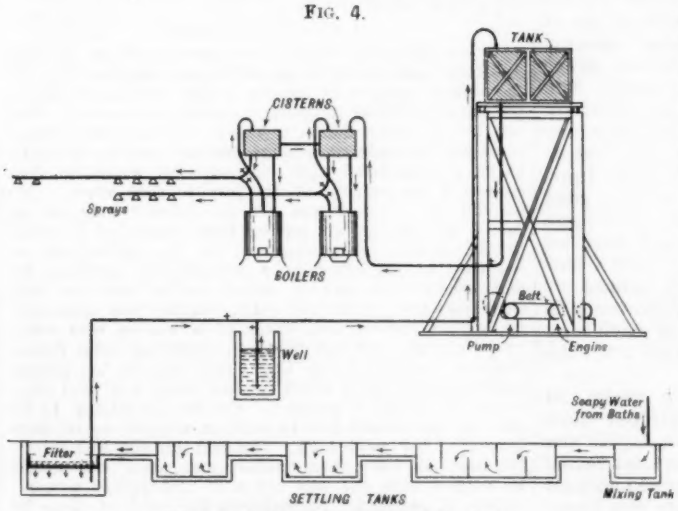


Diagram of the water-supply and filter-beds.

Treatment of the Used Water.

The last point of interest is the method of using the water over again. This is of the highest importance for two reasons: First, clean water, or even water of any kind, is very scarce in this part of Belgium in summer; secondly, it is highly objectionable to pour from 2000 to 4000 gallons of soapy water into the ditch near the baths. If this were allowed it would accumulate and decompose in the hot sun, since owing to the flatness of the country there are no possible means of draining it away.

The following method was devised by Captain Basil Hughes and myself after a number of experiments with a working model.

From Fig. 4 it will be seen that the soapy water runs from the bath-house into a mixing-tank. Slaked lime is placed in this tank, and thoroughly mixed by means of a windmill-mixer constructed from a couple of old bicycle wheels and a hop pole. When the wind fails the mixing must be done by hand; but this is hard work. The lime throws down the soap as insoluble calcium stearates, bringing down at the same time all the dirt and impurities. The effluent runs through three up-and-down settling-tanks, placed all on the same level. These are built of brick with concrete floors. The partitions are removable wooden frames with canvas centres. The three settling tanks are respectively 3, 4, and 5 feet wide. This gradual widening of the tanks tends to retard the flow of the stream, thereby assisting precipitation. All the calcium stearates will be found to have settled down in the first two tanks. The third tank is used for precipitating the lime and removing the soapy oils. This is effected by means of washing soda, which is run into the tank from a drum containing a saturated solution of sodium carbonate. This precipitates the calcium salts—chiefly hydroxides—as insoluble calcium carbonate, which immediately falls to the bottom of the tank. In addition to this the sodium carbonate causes the soluble oils from the soap to separate out. These oils, which give the water an odour of soap, float on the surface, and are absorbed by means of canvas or sacking nailed on to wooden frames. The canvas is changed daily. From this third settling tank the water flows into a charcoal filter containing 4 inches of powdered charcoal between two layers of sacking. Through this filter it runs down into a bricked, concreted well, and is pumped thence into the elevated tank by the petrol pump. Thin canvas screens, stretched on strong wire frames, are placed in the channels connecting the precipitating tanks. These hold back the scum of lime which separates out on the water cooling. The first precipitation tank is cleaned out every three or four days, and the mixing tank daily. The sludge is buried. The sludge, which is odourless except for a slight smell of lime, does not show any tendency to decompose. The water after treatment is quite clear, free from dirt, soap, lime, and soapy oils; and, furthermore, it gives a good lather with soap on being used again. The same water may be treated by this method and used an indefinite number of times. The only fresh water required is that to replace the loss caused by cleaning the tanks. No great quantity, however, is requisite, since most of the contents of each tank can be pumped into the succeeding one until the sediment is reached.

In experimenting with the working model, in order to ascertain the size of the charcoal filter required for dealing with 4000 gallons a day, it was shown that the rate of flow through the filter varied directly as the height of the superimposed column of water. A charcoal filter 6 feet square was found to be adequate. This filter consists of a wooden frame 6 feet square and 18 inches high, lined with zinc. The floor, made of zinc, is perforated with holes of medium size. The latter is covered with sacking, on which a layer of powdered charcoal 4 inches thick is spread. This is covered with sacking, which is changed and washed daily.

A separate bathroom for officers, on the same principle, has now been added, and as many as 35 in one day have taken advantage of it.

The system I have described is characterised by its easy method of construction, its simplicity, and its mobility. It has now been working for several months, and its results have proved satisfactory in every way. I can strongly recommend this method as highly suitable where large numbers of men have to be dealt with, and more especially in those places where water is scarce.

MEDICINE AND THE LAW.

The Case of Lieutenant Codere.

AT the recent assizes at Winchester Lieutenant Georges Codere, of the 41st Canadian Regiment, was sentenced to death on Feb. 5th for the murder of Sergeant H. M. Ozanne, of the 9th Canadian Rifles, at Grayshott on Dec. 8th, 1915. The fact that Codere killed Ozanne was not in dispute at his trial, the defence turning upon the question whether the prisoner was, or was not, insane in a degree recognised by the law as absolving him from responsibility when he committed an act which otherwise constituted a murder, characterised by brutal cruelty and by no small amount of effrontery. Mr. Justice Darling appears to have attached no great weight to the defence of insanity and to the evidence called in support of it, and the prosecution was able to lay medical evidence before the jury to rebut that put forward on the prisoner's behalf. Dr. Maurice Craig was called, having been instructed by the Treasury to visit and examine Codere in prison, and his testimony as to nothing abnormal, such as would suggest irresponsibility, being observed by him is entitled to the greatest weight. At the same time, it will be a source of some surprise if the verdict of the jury, stated to have been arrived at in 20 minutes, does not occupy for a longer period than that the attention of the Court of Criminal Appeal and of the Home Office. In these circumstances we refrain from recapitulating. It is also undesirable to do more than to say that the prisoner was regarded as eccentric in his regiment, and that there were facts narrated as to his personal and family history as well as medical evidence of his present condition which will no doubt receive further and serious consideration.

"*Personal Knowledge.*"

At the Central Criminal Court recently Dr. A. H. Vassie was found not guilty on an indictment charging him with the serious offence of making a false declaration for the purpose of enabling a person to obtain a passport. There can be no doubt that Dr. Vassie had not the slightest intention to evade or infringe the law, and he is entitled to be congratulated upon an acquittal which no doubt embodied the opinion of the jury to that effect. That he did in some degree act imprudently may be said to be proved by his having been compelled to submit to the ordeal of prosecution by the authorities, and his case should serve as a warning to medical men and others who may be urged, as he was, to oblige their patients or friends. Dr. Vassie was approached by an old patient, the uncle of a woman who wished to go abroad, and was asked to make the usual declaration on her behalf, to the effect that to his personal knowledge he could vouch for her being a fit and proper person to receive a passport. She was introduced to him and he questioned her in such a manner as to assure himself of her good faith. She said that she was going to Germany to nurse her mother, and there was nothing to suggest that she was not a fit and proper person to receive a passport. Nevertheless the passport came into the hands of the police when they arrested the woman under the Defence of the Realm Act in July, 1915, nearly a year after Dr. Vassie's intervention in the matter, and she was sentenced to ten years' penal servitude. The judge, summing up, pointed out that the fact of the applicant being personally questioned by the accused made it impossible to say that he had no personal knowledge of her. In cross-examination for the defence

attention had been called to the fact that no definition of the expression "personal knowledge" was attempted upon the document containing the words. Possibly this omission will be supplied in future, but if not the case of Dr. Vassie will have to be cited as a precedent by those who may be asked to support applications of a similar kind. Passports at the present time are matters of serious importance, and no doubt our experience gained during this period of war will cause us to regard them in this way. It may not be easy to give a general definition of "personal knowledge" which will fit all the cases in which a person is asked to give a certificate as to the character of another, but as a practical rule we should say that "personal knowledge" in a document of any solemnity or importance implies more than the mere fact of an interview. It must be taken to imply a knowledge gained independently of the occasion for which the document is made out and signed. After all, no prudent person would speak of his "personal knowledge" of a man whom he was recommending for a post of trust merely upon the strength of an introduction by a relative and of the favourable impression produced by one interview. A prudent person would explain the limitations of his knowledge, but in a formal document there is not usually any opportunity for such explanation.

A Medical Man's Action against a Friendly Society.

At the Southampton county court his honour Judge Gye recently tried an action brought by Mr. A. H. Burnett to recover £18 6*s.* 6*d.*, the defendants being the trustees of the Juvenile Oddfellows' Society. The plaintiff's case was that in accordance with an arrangement made by certain of the medical men of the district he had attended members of the society according to a fixed scale of fees, sending his accounts direct to the patients. The society undertook responsibility for the amounts owing, and the secretary was informed by the plaintiff of his willingness to give medical attendance to those asking for it on the terms agreed. Some of the accounts were, however, not paid when sent in, the defendants alleging that they were not liable when the fees were in respect of patients whose subscriptions were in arrear, and contending that it was for the medical man who was called in to ascertain that the patient was entitled to medical attendance. His honour in the course of the trial intimated that in his opinion it was for the society to inform the medical men when its members' subscriptions were in arrear, and evidence was given to the effect that when the medical men originally met the representatives of the society and entered into an arrangement with them, it was intimated on behalf of the society, in reply to a question upon the subject, that in the case of arrears for not more than three months no notice of arrears would be taken, and the fees would be paid. His honour Judge Gye, in giving judgment for the plaintiff, expressed the opinion that the action ought not to have been defended, and emphasised his disapproval by granting costs on a higher scale than counsel had asked.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments are notified:—Fleet-Surgeons: W. J. Colborne to R.M.A. Barracks, Eastney; R. Hill, C.V.O., to the *Iron Duke* (and for general staff duties); M. R. L. Rodd to R.M. Infirmary, Deal; and E. Sutton to the hospital ship *Plassy*. Surgeon: A. E. Panter to the *Pembroke*. Surgeons (Temporary): H. S. Jefferies to the *Cormorant*, additional, for Ascension Hospital; J. A. Prendergast to the *Vivid*, additional, for Plymouth Hospital; and A. B. G. Underwood to the *Pembroke*, additional, for Chatham Hospital.

ARMY MEDICAL SERVICE.

Temporary Lieutenant-Colonel Peter B. Giles, C.B., R.A.M.C., to be temporary Colonel from Sept. 1st, 1915, to Dec. 31st, 1915.

ROYAL ARMY MEDICAL CORPS.

Major C. H. Straton to be temporary Lieutenant-Colonel whilst commanding 39th Field Ambulance, from Nov. 6th to Dec. 6th, 1915.

The undermentioned temporary Captains to be temporary Majors:—A. N. Minns, whilst commanding 39th Field Ambulance, and R. H. Cooper.

Temporary Major B. E. Myers relinquishes his commission on appointment to the New Zealand Medical Corps.

Lieutenant D. V. M. Adams, Reserve of Officers, to be Captain.

Temporary Captains C. G. Whorlow and F. A. Cooke relinquish their commissions.

Temporary Captain F. W. Mackenzie is placed temporarily on retired pay on account of ill-health.

The undermentioned temporary Lieutenants to be temporary Captains:—S. T. Davies, G. C. Adeney, T. P. Devlin (late Captain, Royal Field Artillery, Territorial Force), F. Barnes, G. L. Leggat, J. M. Barkley, S. J. Ormond, R. Marshall, J. Stephenson, R. M. Boyd, E. Kidd, J. M. Rishworth, W. R. S. Watkins, T. J. L. Thompson, C. H. Nash, F. D. Walker, R. H. Hutchinson, T. L. Llewellyn, B. C. Ewens, D. Forde, D. F. Curran, C. P. V. MacCormack, H. S. C. Hooper, A. Poole, G. Robinson, J. Hill, J. P. Lavery, and J. R. Turner.

Temporary Honorary Lieutenant A. C. Inman to be temporary Honorary Captain.

The undermentioned to be temporary Captains:—R. S. Berry (late temporary Captain, R.A.M.C.), J. R. Williamson (late temporary Captain, I.M.S.), Lieutenant F. Perras, C.A.M.C., and A. Cleghorn, C.A.M.C.

The undermentioned to be temporary Lieutenants:—J. A. Thoms, H. W. Barber, E. C. Sparrow, A. H. Ernst, R. N. Craig, A. H. G. Burton, W. G. Porter, J. A. Macarthur, W. M. Nairn, J. W. Potter, A. Whittome, E. G. Wheat, and J. P. Brown.

The undermentioned Lieutenants of the C.A.M.C. to be temporary Lieutenants: M. C. Bridgman, A. McNally, A. E. McCulloch, G. J. Hanley, C. B. Cameron, W. G. G. Coulter, W. Dixon, J. E. Bromley, C. G. Merrick, and G. H. Kearney.

The undermentioned temporary Honorary Lieutenants to be temporary Lieutenants: F. K. Marriott, E. G. Barker, G. W. Huggins, R. B. Eadie, J. S. Leslie, and T. C. Bowie.

The undermentioned to be temporary Honorary Lieutenants:—H. Lewis, L. M. Davies, J. G. Jones, A. Sunderland, A. Wilson, L. Gameson, and P. R. O'R. Phillips.

The undermentioned temporary Lieutenants relinquish their commissions:—T. Marron, W. C. Burns, A. F. W. Millar, and J. Ellison.

SPECIAL RESERVE OF OFFICERS.

Royal Army Medical Corps.

The undermentioned Lieutenants to be Captains:—R. G. McElney, Ian G. M. Firth, C. G. Schurr, J. W. Malcolm, J. S. Armstrong, E. S. Rowbotham, and O. D. Jarvis.

TERRITORIAL FORCE.

Army Medical Services.

Lieutenant-Colonel G. F. Gubbin, retired pay, from Deputy Assistant Director of Medical Services, to be Assistant Director of Medical Services, London Division, with the temporary rank of Colonel. Captain C. H. Gregory, from Home Counties Field Ambulance, to be Deputy Assistant Director of Medical Services, Home Counties Division.

Royal Army Medical Corps.

Welsh Border Mounted Brigade Field Ambulance: Lieutenant H. C. Gilmore to be Captain.

Home Counties Field Ambulance: Captain H. C. Barr, from Attached to Units other than Medical Units, to be Captain.

Lowland Field Ambulance: Lieutenant R. Kyle to be Captain.

South Midland Field Ambulance: Lieutenant E. J. C. Groves to be Captain.

North Midland Casualty Clearing Station: C. Cooke to be Lieutenant.

London Field Ambulance: Lieutenant-Colonel M. Taylor relinquishes his commission on account of ill-health.

Wessex Field Ambulance: Captain J. G. Macindoe to be Major.

Northern General Hospital: The undermentioned Lieutenants to be Captains: W. Longley and Isa C. Marshall.

Wessex Casualty Clearing Station: Captain A. C. Alport, South African Medical Corps, Reserve, to be Captain.

Notts and Derby Mounted Brigade Field Ambulance: Lieutenant W. Bailey-Thomson to be Captain.

East Anglian Field Ambulance: Lieutenant W. J. Wilkinson to be Captain.

Highland Field Ambulance: Captain H. G. Bruce, from Attached to Units other than Medical Units, to be Captain. Lieutenant W. C. D. Wilson to be Captain.

Attached to Units other than Medical Units.—R. E. Williamson (late Lieutenant-Colonel, The Duke of Wellington's (West Riding Regiment)), Major J. G. Macindoe, from Wessex Field Ambulance, Captain S. Martyn, Captain R. Lindsay, and G. W. McIntosh (late Captain, The Black Watch (Royal Highlanders)) to be Majors. James Lilwall-Cormac to be Lieutenant.

A SUM of £20,000 has been bequeathed to the Inverness Infirmary by Miss A. M. Grant, of Inverness, who recently died there in her eighty-sixth year. Miss Grant was a sister of the late Surgeon-General Grant, of the Indian Army.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In the 96 English and Welsh towns with populations exceeding 50,000 persons at the last Census, 7615 births and 5297 deaths were registered during the week ended Saturday, Feb. 12th. The annual rate of mortality in these towns, which had been 14·2, 14·0, and 14·7 per 1000 in the three preceding weeks, rose in the week under notice to 15·2 per 1000 of their aggregate population, estimated at 18,136,180 persons at the middle of the year 1914. During the first six weeks of the current quarter the mean annual death-rate in these towns averaged 14·4, against a corresponding rate of 13·7 per 1000 in London. Among the several towns the annual death-rate last week ranged from 6·7 in Oxford, 8·4 in Eastbourne, 8·7 in Wimbledon, and 8·8 in Edmonton and in Norwich, to 21·1 in Dudley and in Sunderland, 23·2 in Burnley, 24·5 in Ipswich, and 24·8 in West Bromwich.

The 5297 deaths from all causes were 199 in excess of the number in the previous week, and included 345 which were referred to the principal epidemic diseases, against numbers increasing from 305 to 340 in the three preceding weeks. Of these 345 deaths, 121 resulted from whooping-cough, 71 from diphtheria, 64 from infantile diarrhœal diseases, 63 from measles, 18 from scarlet fever, and 8 from enteric fever, but not one from small-pox. The annual death-rate from these diseases was equal to 1·0 per 1000, and coincided with that recorded in the previous week. The deaths attributed to whooping-cough, which had been 74, 80, and 104 in the three preceding weeks, further rose to 121, and included 24 in London, 11 in Liverpool, 8 in West Ham, 7 each in Birmingham and Sheffield, and 6 in Coventry. The deaths referred to diphtheria, which had declined from 84 to 63 in the four preceding weeks, rose to 71, of which 20 were registered in London, 4 each in Portsmouth and Plymouth, and 3 each in Birmingham, Derby, and Liverpool. The deaths from diarrhœa and enteritis (among infants under 2 years), which had been 60, 68, and 70 in the three preceding weeks, fell to 64; 16 deaths occurred in London, 8 in Birmingham, and 4 each in Manchester and Salford. The fatal cases of measles, which had declined from 81 to 62 in the five preceding weeks, numbered 63, and included 9 in Leeds, 7 in Bristol, 6 in London, 5 in Burnley, and 4 each in Stockport and Hull. The deaths attributed to scarlet fever, which had been 10, 25, and 28 in the three preceding weeks, fell to 18, and included 2 each in London, Wigan, and Leeds. The fatal cases of enteric fever, which had been 9, 9, and 12 in the three preceding weeks, fell to 8, of which 2 occurred in Wigan.

The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, which had been 2257, 2189, and 2153 at the end of the three preceding weeks, further fell to 2108 on Saturday last; 196 new cases were admitted during the week, against 286, 260, and 253 in the three preceding weeks. These hospitals also contained on Saturday last 1576 cases of diphtheria, 176 of whooping-cough, 52 of measles, and 50 of enteric fever, but not one from small-pox. The 1238 deaths from all causes in London exceeded the number in the previous week by 33, and corresponded to an annual death-rate of 14·3 per 1000. The deaths referred to diseases of the respiratory system, which had declined from 264 to 225 in the four preceding weeks, were again 225 in the week under notice, and were 230 below the number registered in the corresponding week of last year.

Of the 5297 deaths from all causes in the 96 towns, 202 resulted from violence and 420 were the subject of coroners' inquests, while 1506 occurred in public institutions. The causes of 51, or 1·0 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in London and in its 14 suburban districts, in Leeds, Bristol, Bradford, Newcastle-on-Tyne, and in 51 other smaller towns. Of the uncertified causes, 9 each were registered in Birmingham and Liverpool, 4 in Manchester, and 2 each in Nottingham, Preston, Barrow-in-Furness, Hull, South Shields, and Gateshead.

HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns with an aggregate population estimated at 2,355,300 persons at the middle of this year, 1036 births and 734 deaths were registered during the week ended Saturday, Feb. 12th. The annual rate of mortality in these towns, which had been 14·4, 14·6, and 13·4 per 1000 in the three preceding weeks, rose to 16·3 per 1000 in the week under notice. During the first six weeks of the current quarter the mean annual death-rate in these towns averaged 15·0, against 14·4 per 1000 in the large English towns. Among the several towns the death-rate last week ranged from 10·3 in Clydebank, 11·1 in Motherwell, and 11·5 in Perth, to 18·4 in Aberdeen, 22·1 in Greenock, and 29·8 in Coatbridge.

The 734 deaths from all causes were 128 in excess of the number in the previous week, and included 71 which were referred to the principal epidemic diseases, against 59 and 50 in the two preceding weeks. Of these 71 deaths, 32 resulted from measles, 18 from diphtheria, 11 from scarlet fever, 5 from whooping-cough, 3 from infantile diarrhœal diseases, and 2 from enteric fever, but not one from small-pox. The annual death-rate from these diseases was equal to 1·6, against 1·0 per 1000 in the large English towns. The deaths attributed to measles, which had been 19, 29, and 22 in the three preceding weeks, rose to 32, and included 12 each in Glasgow and Coatbridge, 4 in Greenock, and 2 in Edinburgh. The deaths referred to diphtheria, which had been 8, 15, and 14 in the three preceding weeks, rose to 18, and included 7 in Glasgow and 3 each in Dundee, Aberdeen, and Paisley. The fatal cases of scarlet fever, which had been 9, 7, and 7 in the three preceding weeks, rose to 11, and comprised 6 in Glasgow, 2 each in Edinburgh and Paisley, and 1 in Motherwell. The 5 deaths attributed to whooping-cough were 2 in excess of the average in the earlier weeks of the quarter, but showed no excess in any individual town. The deaths of infants (under 2 years), which had been 4, 13, and 6 in the three preceding weeks, fell to 3. The 2 fatal cases of enteric fever were registered in Glasgow.

The deaths referred to diseases of the respiratory system, which had been 92, 97, and 93 in the three preceding weeks, rose to 96 in the week under notice, but were 182 below the number registered in the corresponding week of last year. The deaths from violence numbered 34, against 23 in each of the two preceding weeks.

HEALTH OF IRISH TOWNS.

In the 19 town districts of Ireland, with populations exceeding 10,000 persons at the last Census, 585 births and 419 deaths were registered during the week ended Saturday, Feb. 5th. The annual rate of mortality in these towns, which had been 17·4, 17·9, and 17·6 per 1000 in the three preceding weeks, rose in the week under notice to 19·0 per 1000 of their aggregate population estimated at 1,148,468 persons at the middle of last year. During the first five weeks of the current quarter the mean annual death-rate in these town averaged 18·6, against corresponding rates of 14·2 and 14·7 per 1000 in the English and Scotch towns respectively. The death-rate during the week under review was equal to 20·1 in Dublin (against 13·9 in London and 13·0 in Glasgow), 16·9 in Belfast, 17·7 in Cork, 19·0 in Londonderry, 21·7 in Limerick, and 24·7 in Waterford, while in the 13 smaller towns the mean rate was 20·5 per 1000.

The 419 deaths from all causes were 31 in excess of the number in the previous week, and included 30 which were referred to the principal epidemic diseases, against 32 and 27 in the two preceding weeks. Of these 30 deaths, 11 resulted from whooping-cough, 8 from infantile diarrhœal diseases, 5 each from measles and diphtheria, and 1 from scarlet fever, but not one from enteric fever or from small-pox. The annual death-rate from these diseases was equal to 1·4, against corresponding rates of 1·0 and 1·1 per 1000 in the English and Scotch towns respectively. The deaths attributed to whooping-cough, which had been 5, 8, and 7 in the three preceding weeks, rose to 11, and comprised 6 in Belfast, 2 each in Dublin and Limerick, and 1 in Ballymena. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 6, 8, and 8 in the three preceding weeks, were again 8 in the week under review, and included 6 in Dublin. The fatal cases of measles, which had been 14, 9, and 6 in the three preceding weeks, numbered 5, of which 3 occurred in Belfast and 2 in Dublin. The 5 deaths from diphtheria were 3 in excess of the average in the earlier weeks of the quarter, and included 2 in Belfast. The fatal case of scarlet fever was registered in Cork.

The deaths referred to diseases of the respiratory system, which had declined from 147 to 63 in the five preceding weeks, rose to 76 in the week under notice, but were 94 below the number registered in the corresponding week of last year. Of the 419 deaths from all causes, 145, or 35 per cent., occurred in public institutions, and 9 resulted from violence. The causes of 18, or 4·3 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest, and included 4 in Dublin and 3 in Limerick; in the large English towns the proportion of uncertified causes did not exceed 1·1 per cent.

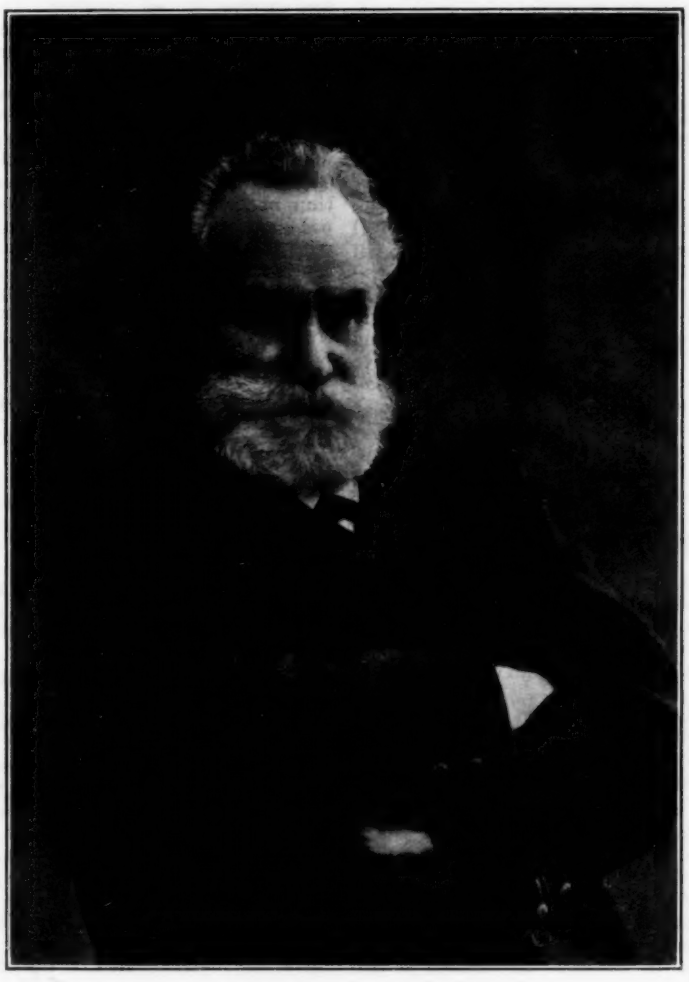
MUMPS AT WICK.—The attendance at the board school in Wick has recently been very low. During the month of January 1568 absentees were visited by a school officer, who found that they were nearly all suffering from mumps.

Obituary.

IVAN PETROWITCH PAVLOV,

DIRECTOR OF THE PHYSIOLOGICAL SECTION OF THE IMPERIAL INSTITUTE OF EXPERIMENTAL MEDICINE, AND PROFESSOR IN THE IMPERIAL MILITARY ACADEMY OF MEDICINE, PETROGRAD.

THE death of this distinguished physiologist was announced at the end of last week by Reuter's Petrograd correspondent. Pavlov was born in Rezan in 1849, so that he died at the age of 67. Pavlov's work and that of his numerous Russian pupils were brought to the notice of British physiologists and physicians through the translation by Professor W. H. Thompson of Pavlov's collected works, originally published in the Russian language in 1897. So important were those lectures on the work of the digestive glands that they were reproduced in German and French, and finally in English. The first English edition was published in 1902 and the second in 1910. These lectures represent the work of nearly ten years by Pavlov and his pupils. It must be remembered that the Imperial Institute of Experimental Medicine is specially built for physiological research, and owes its existence to the enlightened benevolence of Prince Alexander of Oldenburg. It is not too much to say that the researches of the Petrograd School of Physiology opened up a new era in the study of the physiology and pathology of digestion, both from the point of view of the physiologist and practising physician. Success only became possible by using the most perfect cleanliness in all operations on the animals used—in fact, by applying the same technique and after-treatment in animals (chiefly dogs) as are applied in man himself. Under perfect antiseptic conditions, Eck's fistula—the union of portal vein and inferior vena cava—after many failures became possible, as did also that of fistulæ of various kinds for the study of the secretions of the digestive glands. Many of Pavlov's results have now become part of general physiological knowledge. The record of original work is a brilliant one. Many problems were solved and new ones foreshadowed. We now know that the vagus contains specific secretory nerves for the gastric glands, while the gastric juice itself works with great precision, that the juice as it flows from the glands possesses a constant acidity, that the rate of flow and composition of the juice vary and are determined by every single kind of food. Similar results are claimed for the work of the pancreas, there being an adaptation of the secretion to the nature of the requirements—so it would appear that the gastric and pancreatic juices are poured out in correspondence, both qualitatively and quantitatively, to the amount and kind of food partaken of. The discovery of secretin by Bayliss and Starling in 1902, and later of gastrin by Edkins, added a new and important factor—a chemical factor—to the elucidation of the secretory phenomena of the digestive juices. The importance of "appetite" and the secretion of gastric "appetite juice" received a careful analysis. No less remarkable were the results obtained on the functions, uses, and conditions under which the salivary glands act—the specific excitability of the peripheral endings of the salivary nerves is very susceptible and comprehensive. Enterokinase, a ferment of ferments, was then discovered in the intestinal juice—a juice which was elevated to a high position as a digestive agent by the researches of Shepovalnikow.



IVAN PETROWITCH PAVLOV.

One of Pavlov's most suggestive lectures for the physician is that on "Physiological Action and the Teaching of Instinct; Experiences of the Physician," including the rationale of the menu, the effects of

bitters, and the importance of appetite. This lecture epitomises the great practical importance of Pavlov's work from a dietetic point of view, work which provides a sound basis for the explanation of many pathological phenomena connected with the alimentary canal. Pavlov was a charming personality, beloved by his pupils, for he was ever ready to stimulate their researches and to grant them opportunities and his personal aid in their execution.

JOHN PINKERTON, M.D. GLASG., F.R.F.P.S. GLASG., F.R.C.S. EDIN.,

HONORARY PHYSICIAN TO H.M. THE KING; SURGEON-MAJOR-GENERAL, I.M.S. (RETIRED).

Surgeon-Major-General John Pinkerton, who died on Feb. 11th, entered the Indian Medical Service in 1855, and after a service of 38 years in India he retired in 1893. During his service he held many important posts. He was Superintendent-General of the Vaccination Department of the Bombay Presidency from 1868 till 1876; he organised the department and drafted the first Vaccination Bill in India which became law in 1877. From 1876 till 1882 he was in charge of the European General Hospital in Bombay city, the most important executive charge in the Presidency. He had been a Fellow of the Bombay University since 1868, and was twice dean of the medical faculty. For five years preceding his retirement he was at the head of his service, and when he retired he was a member of the Legislative Council of the Presidency. He received the reward for meritorious services, commonly called the "Good Service Pension," while on his retirement he was appointed honorary physician to Queen Victoria. Later he was also honorary physician to King Edward VII. and to his present Majesty King George V. In 1894 he was unanimously elected a Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow, on the ground of distinction in medical science and practice. In 1907 he was made a Fellow of the Royal College of Surgeons of Edinburgh.

Surgeon-General Pinkerton lost his only son, Dr. John Pinkerton, in the Russo-Turkish War of 1878. He is survived by a daughter, who in 1874 married Dr. Ebenezer Duncan, now President of the Royal Faculty of Physicians and Surgeons of Glasgow.

FREDERICK THOMAS BISHOP LOGAN, M.R.C.S., L.R.C.P. EDIN.

Mr. F. T. B. Logan, who recently died at Bristol in his fifty-ninth year, was the son of the late Mr. J. Logan, surgeon, of Bristol. He received his medical education at the Bristol Medical School and Guy's Hospital, London, qualifying in 1879. He commenced practice in Bristol and was medical officer to the Bristol sanitary infectious and Bedminster fever hospitals. He was also a district medical officer and public vaccinator for the Long Ashton union. Mr. Logan was a good sportsman and was at one time captain of the Old Bristolians Cricket Club, South Bristol Hockey Club, and president of the Gloucester Football Association. Mr. Logan was greatly respected in Bristol, where he will be much missed.

Mr. William Monckton, M.R.C.S., L.R.C.P., L.M. Edin., who recently died in London in his eightieth year, was for many years medical officer of health of Portishead, Somerset.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Camp Jaundice.

MM. Sarrailhé and Clunet have reported to the Medical Society of the Hospitals a study made in Gallipoli of a number of cases of icterus. Camp jaundice was noted under the following conditions. The troops were fatigued, they had been restricted for several weeks to a confined area, on a limited diet and exposed to bad weather. In most of the cases the jaundice occurred in the course of an epidemic of febrile gastric disturbance or succeeded this. Occasionally the jaundice came first. Blood cultures showed that the two conditions were not simply coincident but that the icterus was actually due to a hepatic localisation of the paratyphoid virus, which was found in the blood 294 times out of 606 examinations. The persistence of the colouration of the stools, the absence of pruritus, the presence of albuminuria and urobilinuria associated with the elimination of pigment by the urine, the diminution of the resistance of the red blood cells, the association with vesicular and hepatic reactions, these were the most interesting points which commonly occurred. From a bacteriological standpoint the authors have witnessed a distinct change in the biological characters of the organisms isolated from the blood coincident with the appearance of icterus in the course of an epidemic of paratyphoid.

Sero-therapy and Latent Infections.

Dr. Roux, director of the Pasteur Institute, has just introduced to the Academy of Sciences some work by Dr. Bassuet, which he thinks will be of capital importance in the treatment of the wounds of war. Recently MM. Phocas, Delbet, Quénu, Tuffier, Chaput, Moty, and Schwartz have brought forward observations at the Society of Surgery bearing on the revival of latent infection. They all attributed this revival of the infection of old lesions to surgical intervention, and the reaction so produced has been regarded as harmful in the majority of cases. Dr. Bassuet has also observed examples of the same process, but he thought differently of its significance. Such revival, determined not by operative traumatism, but by the appropriate use of serotherapy, resulted, he found, in advantage to the patient. Dr. Bassuet is surgeon to a hospital for fistula, and has had occasion to treat 421 patients with old wounds who had been in various hospitals for 8 to 14 months without recovering. All these patients have now been treated by the serum of Leclainche and Vallée, the preparation of which was described in THE LANCET of Oct. 9th, 1915. Under this treatment in 49 patients with chronic lesions a revival of an apparently extinct infection had occurred at some spot remote from the wound and point of injection, but always at the cicatrix of another wound, with the result that an abscess formed and opened spontaneously at the old cicatrix. In 31 cases out of 49 débris of clothes, splinters of bone, or fragments of projectiles had been eliminated. Local recovery was coincident with a rapid improvement in the general condition which up to then had given rise to anxiety. Dr. Roux stated that up to date Dr. Bassuet had succeeded in extracting 377 foreign bodies of various kinds: fragments of bone, débris of projectiles, drainage-tube, wire, and so forth, restoring

many patients with a minimum of surgical intervention and delay.

The Treatment of Leprosy by Intravenous Injections of Chaulmoogra Oil.

M. Vahram, impressed by the fact that chaulmoogra oil prescribed by the mouth is often badly tolerated, has attempted to administer it intravenously. For this purpose he has evolved a preparation consisting of an oily emulsion in the presence of gum arabic which, after desiccation in vacuo, is submitted to a prolonged grinding, followed by a suspension in the initial volume of liquid, which is then sterilised at 110° C. This pseudo-solution presents granules of extreme fineness, recalling in their size those of the colloidal state. Injected into the vein this preparation does not produce any reaction, and the patient can rejoin his occupation immediately after the injection. The therapeutic results of this treatment have been most encouraging. From the first injection a return of sensibility has been noticed, attended by progressive diminution of the nodules and the disappearance of open lesions. The quantity of fluid to be injected is small: the initial dose is ¼ c.c., progressively increased up to 2 c.c.

The Secondary Closing of Wounds of War.

Professor Pozzi has presented a note to the Academy of Medicine on the work of MM. Carrel, Dehelly, and Dumas. M. Carrel begins by disinfecting the wound by means of a continuous instillation of hypochlorite of soda 1 in 200 (Dakin's solution). When a bacteriological examination of the wound secretion no longer shows micro-organisms the wound is accurately brought together by strips of plaster. Granulations, when present, are first removed with the curette and the wound laid freely open with a bistoury; it is then closed completely without a drain as in the preceding case. In this way cicatrices are rapidly obtained which are as supple as those of an immediate aseptic operation.

Late Tetanus.

Tetanus may appear 30 or even 50 days after infliction of the wound which appears to have occasioned it, and may occur in wounded men who have received a preventive injection of serum. It may manifest itself without evident exciting cause, but is especially liable to occur in connexion with operations, whether near or remote from the site of the wound, or with the recrudescence of inflammation in the wound itself. The persistence of foreign bodies in the wound is not essential. It must therefore not be forgotten that this malady, so apt to have a fatal termination, may be started by the undertaking of an operation or by the occurrence of suppuration in a wound. The remedy is obvious: to renew the injection of serum with every fresh operation undertaken, to repeat the injection once a week in suppurating cases. The communication brought by Dr. Laveran before the Academy of Sciences was the result of a study made on these lines by Dr. Bazy. Dr. Bazy's example should be rigorously followed. Late tetanus may then disappear from the hospitals.

Feb. 14th.

Mr. J. W. Knapman, the librarian to the Pharmaceutical Society, has just completed 50 years of service in that position. He joined the staff of the society two years before the passing of the Pharmacy Act, and assisted in the compilation of the first register of chemists and druggists.

Correspondence.

"Audi alteram partem."

THE DANGER TO CIVILIAN COMMUNITIES OF A TYPHOID-PARATYPHOID OUTBREAK.

To the Editor of THE LANCET.

SIR,—Timely attention has been called in THE LANCET of Feb. 12th to the increased danger at the present juncture to civilian communities of a typhoid-paratyphoid outbreak. The danger has been emphasised by recent events in Reading. Thanks to the energetic action of the Reading sanitary authority hopes are entertained that the outbreak there has been limited. About 53 cases have occurred with a mortality of 7. Bacteriological investigation of these cases is still in progress. It may be mentioned, however, that the sera from 42 cases have been examined as to their agglutinating properties towards B. typhosus, paratyphosus A, and paratyphosus B. *All* agglutinated B. typhosus in various degrees, 17 agglutinating also paratyphoid as follows: one reacted with paratyphoid A, one with paratyphoid A and B, and the remaining 15 with paratyphoid B. From the results obtained so far it may be said that all these 42 patients have typhoid infection, as none of them had been inoculated against typhoid previously. The presence of a co-existing paratyphoid infection, especially of the A variety, points strongly to infection from a military source. So far as I can learn it has been ascertained that the food- and milk-supply are not to be blamed. The only obvious thing in common to all the cases is the water-supply which, being river water, might conceivably be incriminated. The cases, however, are widely spread as regards locality, and nothing definite in this respect has been ascertained. There is, however, one factor which remains to be considered—viz., the presence in Reading of a large number of sick and wounded as well as a large number of billeted men. Among the sick and wounded are many suffering from, or convalescent from, the typhoid-paratyphoid group of disease. Probably so many patients suffering from this group infection have never been gathered together in this country before. I venture to suggest that this is probably the original source of the infection.

We must also take into consideration the men who come back straight from the dirt and filth of the trenches for a few days' furlough, some of whom may actually bring infection with them. One of the methods of spread is possibly that by hand contact. Of the 53 cases 13 are females of the servant class whose ages range from 14 to 30; about 21 are school children. One of the remaining 18 ministered as a priest directly to sick and convalescent soldiers, and was thus in close touch with them. Another was a stretcher-bearer, whose duty it was to assist at the detraining of convoys, and a third was a post-office official. Most of the cases probably received their infection about or soon after Christmas, when many of the soldiers who were sufficiently fit were entertained in various Reading schools. Another possible source may be the tramcars, which are used extensively by the convalescents who are allowed to spend an hour or two in the afternoon in town. The danger of paper currency cannot be overlooked. The notes pass through all kinds of hands, and

owing to their tendency to stick together it is a common practice to moisten the tips of the fingers with saliva and in so doing infection may be conveyed to the mouth. While isolation of cases and carriers will go a long way to prevent dissemination of the organisms it is nevertheless not sufficient. Cases are bound to pass unrecognised at times and those regarded as clear prove later to be carriers. It is infinitely better to prevent the possibility of this infection, and there is only one way to do this—viz., by preventive inoculation.

The successful application of preventive inoculation to the majority of our soldiers is one of the most brilliant achievements of medicine, and has probably saved more lives than all those lost by violent means. The low incidence of typhoid amongst the troops bears eloquent testimony to the efficacy of antityphoid inoculation, and what I plead for here and for those towns which are liable to be germ centres for the time, is the advocacy by the proper authorities of the value of antityphoid inoculation not for the soldier only, but for the civilian as well.—I am, Sir, yours faithfully,

Reading, Feb. 14th, 1916. ROBERT DONALDSON.

MENTAL DISORDERS AND ATTESTATION.

To the Editor of THE LANCET.

SIR,—Almost daily the very serious question is brought before me as to my duty in reference to the fitness of nervous people for military service. If I had not seen so many cases at the various hospitals for the wounded and invalided soldiers I should have had more hesitation in writing on this subject, but I have come across so many men invalided, in consequence of nervous or mental breakdowns, who, in my opinion, ought never to have been sent to the front. First, I have been asked to give certificate of fitness by men really anxious to serve, who have very slight attacks of *petit mal*. Naturally I have declined to pass such as fit. In other cases I have been consulted by men who, having had more than one attack of insanity, have felt very sensitive because their companions looked upon them as shirkers, and in these cases the question was more difficult because if not allowed to serve they worry and look upon themselves as suspects; this suspicion producing sleeplessness and general ill-health which might readily lead to a fresh breakdown. In these cases, as a rule, I object to their serving in active military work, but encourage munition and other labour.

I think it a safe rule to make that a young man who has had an acute attack of mental disorder within three years should be kept from active service, while if he has had more than one attack he should be rejected. Some of the most difficult cases which I have had to report on have been men who some years before have had serious and prolonged mental disorder, due to overwork or to special strain. Many of these appear to be quite strong, are themselves afraid of breaking down, and also afraid of being thought cowardly. As a rule I prefer to refer such men to the doctors who have had to deal with them in the interval of health. As I have said, it is a serious thing to send men into active service who run real risks of breaking down. The notion that the training will "buck up" the men I have not found to be true. I have in my experience, however, to report that I have known definitely "defectives" who have proved valuable Army Service men or motor drivers.

To sum up my experience, I think it very risky to send any young man who has had a distinct attack of insanity, however well he is at present. I think that there is serious risk for many who have broken down in former years with mental strain. I recognise the risk, however, of over-sensitive neurotics feeling they are looked upon as shirkers. Yet I have found certain defectives as quite efficient in non-military work.

I am, Sir, yours faithfully,

GEO. H. SAVAGE, M.D., F.R.C.P.

Devonshire-place, W., Feb. 14th, 1916.

CLINICAL THERMOMETRY.

To the Editor of THE LANCET.

SIR,—In the very full and otherwise apparently complete bibliography of "Clinical Thermometry" appended to the first part of Professor Sims Woodhead's and Mr. Varrier-Jones's investigations on this subject, published in THE LANCET of Jan. 22nd, I regret to find no mention of the late Dr. Thomas Wrigley Grimshaw's classical paper on the Value of Thermometric Observations in Typhus Fever. That paper was a thesis for the degree of Doctor of Medicine in the University of Dublin, and was read before the University on March 4th, 1867. It was published in the number of the *Dublin Quarterly Journal of Medical Science* for May, 1867 (vol. xliii., No. 86, New Series, p. 313).

I am sure it is necessary only to call the authors' attention to the omission to have it rectified for the sake of the memory of a distinguished Irish pioneer in modern clinical thermometry. The names of other Irish physicians who devoted attention to the subject may be found in the annual reports of the Cork Street Fever Hospital and House of Recovery, Dublin, published in the early decades of the nineteenth century.

I am, Sir, yours faithfully,

JOHN W. MOORE, M.D. Dub., F.R.C.P.I.

Dublin, Feb. 15th, 1916.

FUNCTIONAL NERVE DISEASE.

To the Editor of THE LANCET.

SIR,—It is becoming more than a little amusing to notice how you have only to whisper the word "psycho-analysis" and certain people at once see red. My paper dealt with the psychical effects of modern fighting, but it contained the obnoxious term, and hence this correspondence. How strange it is that those who still reprobate psycho-analysis and the sexual etiology of the neuroses can remain blind to what must long have been recognised by every thoughtful reader of your paper—namely, that the sexual instinct is clean and pure. It will not do nowadays to dress it up in mid-Victorian prejudices as a repulsive and disreputable bogie to affright our intelligence.

It is due to your readers to add, though I dislike having to say it, that the description of psycho-analysis which Dr. Armstrong-Jones offers for their acceptance is a travesty of the facts.

I am, Sir, yours faithfully,

Wimpole-street, W., Feb. 12th, 1916. DAVID FORSYTH

INJECTIONS OF PERMANGANATE OF POTASH IN ALBUMINURIA.

To the Editor of THE LANCET.

SIR,—In THE LANCET of July 31st, 1915 (p. 219), there is an article on this subject which prompts me to make the following remarks. During the last 12 months I have seen one case of uræmia and three of albuminuria with general dropsy successfully treated with hypodermic injections of permanganate of

potash. The case of uræmia, a negro boy 12 years old, was accompanied by convulsions and complete suppression of urine for over 30 hours. The medical man in attendance, seeing no improvement after a variety of treatment, as a last resource gave the patient an injection of 1 c.c. of a 1 per cent. solution of permanganate. In a few hours the patient commenced passing urine freely, the convulsions ceased, and in a fortnight the boy was perfectly well.

A few weeks later I was called in to see a boy of 10 who had been ill for two months with albuminuria and general dropsy. On the third day after my first visit he passed 50 grammes of urine in 24 hours. On boiling a sample of this urine the lower part of the test-tube became filled with a solid mass of albumin. I then gave him, in the arm, a hypodermic injection of 10 drops of a ½ per cent. solution of permanganate. During the following 24 hours he passed 1500 grammes of urine; on boiling a sample there was absolutely no trace of albumin. The case lasted over a month and a half. The albumin again made its appearance, but with three more injections of permanganate the dropsy completely disappeared, he got quite well, and has continued so for over eight months.

I am an M.D. Edin., 1879, have lived in this neighbourhood (north of Uruguay, on the Brazilian frontier) for over 30 years and for some time have lost touch with my medical friends in England, and my excuse for addressing myself to you is the hope that you may be able to induce others to give a trial to the use of hypodermic injections of permanganate of potash in cases of albuminuria. There is usually some local pain in the site of the injection, but this disappears on the application of hot fomentations. As a rule, there is a temporary rise of temperature lasting for a day or two.

Might it not be worth while trying in cases of wounds in the trenches an injection of 1 c.c. of a 1 per cent. solution of permanganate as near the wound as possible and as soon as convenient, in the hope that the oxygen set free may act as a germicide? May not this be the way in which the permanganate acts in treatment of snake-bite? In 1881 a Brazilian doctor made experiments with hypodermic injections of permanganate in snake-bites with such good results that this is now the usual treatment in Brazil.

I am, Sir, yours faithfully,

Minas de Corlabo, Uruguay, Dec. 14th, 1915. F. V. DAVISON.

INVERSION OF THE PELVIC BONES.

To the Editor of THE LANCET.

SIR,—My letter in your issue of Feb. 5th was not intended to be a criticism of Dr. D. Berry Hart's paper, but of the interpretation that had been put upon it. Dr. Hart has fully acknowledged the extent of his indebtedness to Dr. Douglas E. Derry's and Professor F. Wood Jones's work.

As their investigations were made when they were associated with me, I am not unacquainted with the literature of the subject. But it is entirely irrelevant to call attention to Zaaijer's original account of the sulcus preauricularis. What I claimed for Dr. Derry was that he "was the first to give an adequate explanation of the significance" of this well-known groove, after it had been the subject of repeated controversy for 40 years.—I am, Sir, yours faithfully,

G. ELLIOT SMITH.

The University of Manchester, Feb. 12th, 1916.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue:—

Killed.

Lieutenant G. Dewar, R.A.M.C., joined the army on the outbreak of war, and subsequently obtained permission to return to Aberdeen University to complete his medical education. On graduating M.B. he joined the Royal Army Medical Corps, receiving his commission last October.

Captain G. S. R. Stritch, 6th Connaught Rangers, qualified in 1895, and held appointments at the Lock Hospital, Dublin, and at the Argyll and Bute Asylum, and at the outbreak of war offered his services as a combatant officer, having previously been in the Volunteers.

Died.

Lieutenant-Colonel H. R. Duff, Canadian A.M.C., received his M.D. degree at Queen's University, Kingston, Ontario, in 1884, and had been President of the Army Medical Corps Board of Survey for Ottawa.

Lieutenant-Colonel W. M. O'Connor, R.A.M.C., attached to the 6th London Field Ambulance (T.F.), took his M.B., B.Ch. degrees at Dublin University in 1887, and held several appointments in connexion with army medical work.

Lieutenant-Colonel J. W. Stokes, R.A.M.C. (T.F.), 3rd West Riding Field Ambulance, received his medical education at University College, London, qualifying in 1895, and prior to joining the Royal Army Medical Corps was demonstrator of anatomy at Sheffield University and anæsthetist to the Royal Infirmary, Sheffield.

Wounded.

Captain A. R. S. Alexander, I.M.S., attached to the 2/7th Gurkha Rifles.

Lieutenant E. Doherty, R.A.M.C.

Captain H. Dunkerley, R.A.M.C., attached to the 8th Rifle Brigade.

Captain N. R. Rawson, R.A.M.C., attached to the 9th Suffolk Regiment.

Major W. H. Odlum, I.M.S.

Lieutenant F. M. Vajifdar, I.M.S.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following son of a medical man must be added to our lists of those who have fallen during the war:—

Captain T. C. Richardson, R.E., Special Reserve, elder son of Dr. T. A. Richardson, of Clifton, Bristol, and late of Combe Martin, North Devon.

HEALTH OF MUNITION WORKERS.

Two important Memorandums have just been issued by the Health of Munition Workers Committee, of which Sir George Newman is chairman, dealing with Employment of Women (Memo. No. 4) and Hours of Work (Memo. No. 5).

Employment of Women.

At the outset emphasis is laid on the fact that in considering the conditions of employment of women workers, as compared with those of men, account must be taken not only of physiological differences,

but also of those contributions which women alone can make to the welfare of the State, since upon the womanhood of the country most largely rests the privilege of creating and maintaining a wholesome family life and of developing the higher influences of social life. Five matters, apart from questions of wages, concern the health and industrial output of the worker, and demand the careful attention of employers in regard to the employment of women on any large scale. These are given as (1) the period of employment (including night-work, length of hours, overtime, &c.); (2) rest pauses and the provision of meals; (3) sanitary conditions of the factory; (4) physical condition of women workers; (5) questions of management and supervision. Observations are offered under each heading, the result of careful inquiry, and to these we shall return in greater detail. The Committee do not desire to suggest the imposition of conditions which are likely to embarrass employers or restrict the usefulness of women, but deal with matters which in their view are both necessary and urgent in the interest of the women themselves, and the industrial output of which they are capable. They state their conclusion that if the present long hours, the lack of helpful and sympathetic oversight, the inability to obtain good, wholesome food, and the great difficulties of travelling are allowed to continue, it will be impracticable to secure or maintain for an extended period the high maximum output of which women are undoubtedly capable.

Hours of Work.

The maintenance of the high maximum output combined with consideration of what is immediately practicable regarding the health of the worker in relation to this output is the theme of this Memorandum. The limits of hours which the Committee propose are based on the expectation that the war will be of long duration, and are such as they think can reasonably be continued over a protracted period.

Overtime, which is commonly justified on the ground that no other arrangement is possible owing to a dearth of workers and to the difficulties of increasing plant, has a number of attendant objections. At one time cases of men working as much as 90 hours per week were common; more recently there has been a tendency to reduce hours, but even so weekly totals of 70 to 80 hours are still frequent. Some overtime is no doubt inevitable, but the Committee are satisfied that hours such as these cannot be worked with impunity. The objections to overtime are briefly stated as follows:—

1. It is liable to impose too severe a strain on the workers. Many witnesses assert that while for emergency overtime is effective, after a period the rate of production tends to decrease and the extra hours to produce little or no additional output. Moreover, the quality of the output may be adversely affected during the whole period of work and not only during the hours of overtime.

2. It frequently results in a large amount of lost time. In part this is to be attributed to the workers becoming exhausted and taking a rest, and also to sickness, noticeable chiefly amongst the older men and those of weak constitution.

3. It imposes a very serious strain upon the management, the executive staff, and the foremen, both on account of the actual length of the hours worked and the increased worry and anxiety to maintain output and quality of work. These men cannot take days off duty like the ordinary workers.

4. It is liable to curtail unduly the period of rest and sleep available for those who have to travel long distances to and from their work, a matter of special importance in the case of young persons.

5. The fatigue entailed increases the temptation to men to indulge in the consumption of alcohol; they are too tired to eat, and seek a stimulant.

While, then, the Committee recognise that overtime must continue, they suggest that it should be subject to certain definite restrictions, which are dealt with under the headings of shifts, night work, spells and breaks, and holidays, with special consideration of the different conditions applicable to adult males, women and girls, and boys. A final judgment is reserved until there has been an opportunity to observe the effects of restricted Sunday work, a reform which, it is hoped, will follow as a result of the recommendation put forward in the first Memorandum of the Committee.

THE DUTIES OF A SANITARY SECTION IN THE FIELD.

Major Charles E. Goddard, R.A.M.C. (T.), sends the following notes upon the duties of a Sanitary Section in the field:—

From time to time we hear of the remarkable work that is being accomplished by different branches of the Sanitary Service, and it may therefore be considered an opportune moment to refer to the special work of a Sanitary Section. Though not actually a new unit in army establishments, a brief note as to its source, distribution, and special duties will afford many points of interest to the student of army sanitation.

It will be remembered that at the outbreak of war, or soon afterwards, instructions were received from the War Office to increase the strength of the London (Territorial) Sanitary Companies by enrolling new companies with a view to the formation of sanitary sections for service in the field. So successful was the response, and so efficient the training and equipping of the men, that every division of the army has been supplied with one of these sections. Each of the sections has a personnel of 26 men (not including Army Service Corps men)—viz., 1 officer and 25 non-commissioned officers and men. As to the choice of officers, preference has always been given to medical men who are medical officers of health or who hold the Diploma in Public Health, or are bacteriologists; some are sanitary engineers and even architects. A large percentage of the non-commissioned officers are sanitary inspectors, and among the rank and file are found many with sanitary diplomas, plumbers, carpenters, schoolmasters, men of every walk of life, graduates in honours from Oxford, Cambridge, and other universities, solicitors, chemists, and representatives of all the professions and trades. It will be seen that there is no difficulty in providing for each section a sufficient number of disinfectors, interpreters, carpenters, cooks, builders, and, in fact, supplying any man likely to be of special service in the field.

The first 12 sections, with 12 lorries full of equipment, were sent out to France on Christmas Day, 1914, with the senior officer of the 2nd London Sanitary Company in command. Each Division was then, and is now, supplied with one section. The Assistant Director of Medical Services of the Division is responsible for their work. Such work includes the bathing of troops in thousands; disinfecting of the men for vermin, after enteric, cerebro-spinal fever, and other infectious diseases; disinfection of all clothing and blankets; the purification of water; the draining of farms and billets; making or giving instruction for the erection of destructors or incinerators, ablution places, grease traps, urine pits, filters, fly traps, and, in fact, making every kind of installation, structure, or appliance

that appertains to sanitation in the field. It would be quite impossible to enter into details of all the good work done by these men, but reference might be made to the baths that were used at Ypres, for example, in February last. Here, about two miles from the trenches, was a massive red building built and endowed by the late King of the Belgians as a school or reformatory. It had been badly shelled, but the sanitary men soon found tubs and old baths and pumped water into the boilers in the kitchens and had excellent baths going in a few hours. Everything was carried out with system and despatch, and many generals were taken to see the arrangements made for the bathing of the troops there. None of those who saw these baths last February will forget the delight of the men at the sight of the hot baths and hot beef tea on coming out of the trenches, or their racy comments and high spirits in spite of all they were going through. At last the enemy got the exact range of the building. The position became untenable, and other baths had to be arranged for at breweries and other places further back. This huge building and the whole city of Ypres has now been entirely destroyed.

Sometimes the sections are sent to the trenches. On one occasion one of the sections was asked to volunteer to help to collect the wounded who were lying outside the trenches in too great a number for the field ambulance to deal with. Every member offered and went, gaining the thanks of the general through the Assistant Director of Medical Services the next day. On another occasion they were required to take an anti-gas apparatus to the trenches, but the enemy attack was so furious that night that the apparatus had to be abandoned, but the men remained to help the doctors treat the wounded. They had a terrible experience for 36 hours, and one of their number was killed. These sanitary men are not really expected to work in the firing line, but they are sometimes required to work in the reserve trenches, and may occasionally get wounded whilst engaged on purely sanitary work.

These are only a few things which come to one's personal knowledge, but I have heard the men of the Sanitary Sections spoken of on all sides as ever desirous of helping their fighting brothers in every way possible. The Commander-in-Chief, in his last two despatches, has recognised their value by mentioning no less than 13 of their officers and quite a number of their men. It is good to think that there is such a body of expert workers who can assist the Royal Army Medical Corps officers in watching over the health and sanitation of the soldiers.

INVALID PRISONERS OF WAR IN SWITZERLAND.—French and German prisoners of war continue to arrive at various Swiss health resorts. 100 French tuberculous cases have reached Leysin and 100 German have been received at Davos. Prisoners suffering from alimentary and nervous disorders are being sent to the more central parts of Switzerland—the French to Yverdon, Macolin, and Chaumont, the Germans to Vitznau, Brunnen, and Gersau. In spite of numerous rumours to the contrary, no invalided British prisoners have reached Switzerland.

WAR AND EUGENICS.—At a meeting of the Royal Statistical Society held on Feb. 15th Major Leonard Darwin, Sc.D., read a paper entitled "On the Statistical Enquiries needed after the War in connexion with Eugenics." He began by pointing out that though it was difficult to estimate the casualties in this war ours might now be in number as high as 6½ per cent., and Germany's possibly between 20 and 30 per cent., of the number of the fighting men available. But this total loss of progeny due to the war would tell nothing as to racial effects, which would depend on whether those killed were above or below the average in inborn qualities. The classes sifted out before the fighting force entered the fighting line consisted of the shirkers, the rejected on enlistment, the men turned out of the service or kept at home because of incapacity, and those invalided from abroad; on the other hand, many were kept at home because of the qualities of their work. Balancing these conflicting considerations, the conclusion arrived at was that war unquestionably killed off the better types, and was therefore highly dysgenic. The active causes of the damage would not, moreover, cease with the war, because the birth-rates of the higher types would continue to be adversely affected. It followed also that the racial damage would be at its worst when peace was declared, and the checking of the multiplication of the unfit would never be more needed than then. Major Darwin looked at all these matters as part of the whole great question of racial advance or decline on which the fate of nations so largely depended, and he was actuated by the fear that in the excitement of party strife all eugenic reform would be pushed on one side to make room for topics of more immediate interest, in which case there would be grave danger of our country slowly undergoing racial degradation.

DIARY OF A NURSING SISTER.—A correspondent sends us the following interesting comments on a book entitled "Diary of a Nursing Sister on the Western Front, 1914–1915," which was briefly noticed in THE LANCET of Jan. 8th:—

"The diary has evidently been printed much as it was written from day to day, and the result is a most telling picture of life on the ambulance trains carrying the wounded from the front to the base hospitals. It is interesting to note that the *canards* that in the early days of the war caused so much excitement in England, such as the arrival of train-loads of Russians from Archangel, were caught up and believed in by the workers at the front with the same faith and trust.

The first ambulance train, to which this nursing sister was attached, went up to Braisne in October, 1914; there she had her first experience of being under fire, for the shells came not only over the village but also over the train itself, and several of the wounded and of the medical staff had a very narrow escape. Towards the end of October the ambulance trains were flooded with thousands of wounded from the first battle of Ypres, and the difficulty of taking in two or three hundred serious cases in a few hours is dealt with in the most vivid manner, rifles and pick handles being used for splints by the light of flashing guns and burning houses. The want of *chauffage* on board their ambulance trains in the early part of the winter was very distressing, and Christmas was spent in cold and discomfort, yet there is continual praise of the wounded 'Tommies' who bore their pain and helplessness cheerfully, knowing that all that was possible was being done for them.

With the spring the author catches glimpses from the train of cowslips and violets by the wayside, and mentions how the song of the lark and blackbird thrilled the hearts of the nursing sisters even within sound of the guns. But the spring brought also Neuve Chapelle, and a few lines from the entry of March 25th are worth quoting: 'There was a day or two after Neuve Chapelle when the number of wounded overflowed the possibilities of 'collection,' the stretcher bearers were all hit and the stretchers were all used, and there were not enough medical officers to cope with the numbers, and if you wanted to live you had to walk or crawl, or stay behind and die.'

In May the first Royal Army Medical Corps' barges were ready, to the great relief of the lung and abdomen cases, which were so distressed by the jolting of the trains; the barges were only just in time, for on May 10th every field ambulance, barge clearing hospital, and train were blocked with the wounded from Festubert, and while hard put to it to deal with this multitude of cases the Royal Army Medical Corps workers hear the reinforcements marching by singing rag-time through the pouring rain.

From these pages is well seen the contrast between the chaos and confusion of early days to the order and discipline of a few months later, when the Royal Army Medical Corps had coped with difficulties which at first had seemed insuperable. This diary probably represents the experience of many a nursing sister in France whose war notes have not been published; it is, therefore, wisely anonymous, picturing, as it does, the life at the front of some of our noblest workers in the field."

OBITUARY OF THE WAR.

OSCAR GLADSTONE MAGINNESS, M.R.C.S. ENG., L.R.C.P. LOND.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant O. G. Maginness, medical officer, Brentwood Asylum, who was killed in action near Ypres on Dec. 15th, 1915, at the age of 26 years, was the second son of Mr. E. J. Maginness, M.V.O., constructive manager, H.M. Dockyard, Chatham. He was educated at King's School, Rochester, and the Grammar School, Portsmouth, proceeding from the latter to St. Bartholomew's Hospital in 1908, where he received his medical training, becoming qualified in October, 1913. After leaving St. Bartholomew's he was appointed medical officer at Brentwood Asylum, resigning this position to take a commission in the R.A.M.C. in March, 1915. He was killed by a German shell in the trenches. His Colonel writes of him: "He made himself most popular with both officers and men, no trouble was too great for him to undertake, and his care of and attention to the sick were unremitting. He could have remained in safety at a base hospital, but volunteered to come back again to do duty with the troops in the firing line." Lieutenant Maginness was amongst those mentioned in Lord French's last despatches.

Medical News.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At a meeting of Comitia of the Royal College of Physicians of London on Jan. 27th and of the Council of the Royal College of Surgeons on Feb. 10th, diplomas of L.R.C.P. and M.R.C.S. were respectively conferred upon the following 80 candidates (including nine ladies) who have passed the Final Examination in medicine, surgery, and midwifery of the Conjoint Board and have complied with the by-laws:—

*Arthur Wilfrid Adams, Bristol University; John Andrew, St. Bartholomew's Hospital; Mary Neville Andrews, Royal Free Hospital; George Frederick Vernon Anson, Cambridge University and St. Thomas's Hospital; Kenneth Leslie Bates, Guy's Hospital; Alexander William Charles Bennett, St. Thomas's Hospital; Thomas Alexander Palmer Benbow, Jefferson College, Philadelphia; Kalyanpur Harihar Bhat, Madras and Charing Cross Hospital; John Tyldesley Bleasdell, Cambridge and Leeds Universities; Edgar Scott Bowes, Guy's Hospital; Isabel Florence Buckle, Royal Free Hospital; Alan Osborne Courtis, Cambridge University and St. Bartholomew's Hospital; Douglas Crellin, Cambridge University and St. Bartholomew's Hospital; Raghunath Ganesh Dani, University College Hospital; Lionel Meredith Davies, Oxford University and St. Thomas's Hospital; Llewelyn ap Ivan Davies, University College Hospital; Patrick Arthur Dargan, St. Mary's and St. George's Hospitals; Herbert Mervyn Drake, St. Thomas's Hospital; Alan Nigel Drury, Cambridge University and St. Thomas's Hospital; Charles Yarrow Eccles, St. Thomas's Hospital; Mikhail Elias, Cairo and St. Mary's Hospital; †Henry Hawes Elliot, Durham University and Guy's Hospital; Charles Arthur Lovatt Evans, University College Hospital; David John Evans, University College, Cardiff, and Middlesex Hospital; Murray Dudley Evans, London Hospital; William Jones Evans, University College, Cardiff, and University College Hospital; Cyril Gould, University College Hospital; Hugh Ernest Griffiths, University College, Cardiff, and St. Bartholomew's Hospital; Alfred Barnes Gunasekara, Ceylon Medical College and King's College Hospital; Carl Gustave Waldemar Hahr, St. George's Hospital; Alfred Edward Hamlin, Madras University and St. Bartholomew's Hospital; William Llewellyn Aplin Harrison, St. Mary's Hospital; George Edwin Heath, St. Bartholomew's Hospital; Valentine Robert Hirsch, Guy's Hospital; Edwin Lancelot Hopkins, London Hospital; Helen Ingleby, Royal Free and St. George's Hospitals; Vincent Coram James, Middlesex Hospital; James Gaymer Jones, Guy's Hospital; Leslie William Jones, Cambridge University and London Hospital; Ivy Kees, Bombay University and Royal Free Hospital; Charles Edward Kindersley, Cambridge University and St. Bartholomew's Hospital; Mohamed Elwan Abdel Latif, Cairo and Middlesex Hospital; Herman Lewis, London Hospital; Kenneth Thomas Limbery, St. Thomas's Hospital; George Alexander Sheridan Madgwick, London Hospital; Rodney Honor Maingot, St. Bartholomew's Hospital; Labib Abdul Malik, St. Mary's Hospital; Frederick Wyndham Maunsell, Cambridge University and St. Mary's Hospital; Gladys Mary Miall Smith, Royal Free Hospital; Robert Davies Moyle, Johns Hopkins University and Charing Cross Hospital; Nava Ratnam Nalliah, Ceylon Medical College and London Hospital; Hubert Musgrave Oddy, Oxford University and St. Thomas's Hospital; May Olivera, Bombay University and Royal Free Hospital; Edith Winifred Paul, Calcutta and Royal Free Hospital; Percy Reginald O'Rourke Phillips, Cambridge University and St. Thomas's Hospital; Alfred Cleveland Pickett, Cambridge University and St. Thomas's Hospital; Douglas Sherrin Pracy, St. Bartholomew's Hospital; David Rees, University College, Cardiff, and University College Hospital; Edmund Douglas Richardson, Charing Cross Hospital; Miles Kenneth Robertson, Cambridge University and St. Bartholomew's Hospital; George Cuthbert Robinson, St. Thomas's Hospital; John Thomas Samuel, University College, Cardiff, and University College Hospital; †Frederick Joshua Page Saunders, Cambridge University and St. Thomas's Hospital; Ronald James Scarr, Manchester University; Clement Perronet Sells, Oxford University and Middlesex Hospital; George Binford Sellwood, Cambridge University and St. George's Hospital; Edith Annie Shaw and Elsie Stansfeld, Royal Free Hospital; Arthur Sunderland, Charing Cross Hospital; Godfrey Trehane Symons and Henry John Hugh Symons, King's College Hospital; Aly Heidar Taymour, Guy's Hospital; William Henry Thomas, University College, Cardiff, and St. Mary's Hospital; John Aylmer Tippet, St. Thomas's Hospital; Richard Stanley Topham, Leeds University; Hubert Methley von Mengershausen, Manchester University; Herald Joseph Wallace, University College Hospital; Harold Arthur Whyte-Venables, Cambridge University and St. George's Hospital; Harry George Everard Williams, Cambridge University and St. Bartholomew's Hospital; Alban Wilson, University College Hospital; and George Cuthbert Nelson Younger, Middlesex Hospital.

* L.R.C.P. not yet conferred. † M.R.C.S. conferred previously.

Diplomas in Public Health were also conferred, conjointly, upon the following four candidates who have passed the requisite examinations:—

Ratonjee Dinshaw Dalal, Bombay University, St. Bartholomew's and University College Hospitals; Philip Hamill, St. Bartholomew's Hospital; William John Hart, Oxford University, St. Thomas's Hospital, and University College; and Horace Richard Wilson, King's College Hospital.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—An ordinary meeting of the Council was held on Feb. 10th, Sir W. Watson Cheyne, the President, being in the chair. The secretary reported the death on Feb. 1st of Lieutenant-Colonel James Stanley Newton Boyd, R.A.M.C. (T.), member of the Council. A vote of condolence with his relatives was passed. The President stated that the vacancy occasioned by the death of Colonel Stanley Boyd would be filled at the annual meeting of the Fellows in July. It was resolved to issue diplomas of Membership to 79 successful candidates. It was resolved also to issue jointly with the Royal College of Physicians of London Diplomas in Public Health to four successful candidates. A letter was read from the secretary of the Central Midwives Board reporting that the term of office of Mr. C. H. Golding-Bird as the representative of the College on that Board will expire on March 31st; it was resolved to reappoint Mr. Golding-Bird as the representative of the College.

ROYAL INFIRMARY AND ASYLUM, ABERDEEN.—The annual general meeting of the corporation of the Royal Infirmary and Lunatic Asylum of Aberdeen was held in the infirmary buildings on Feb. 9th, when the annual reports were submitted. The report for the Royal Infirmary states that during the year 3141 in-patients were treated, of whom 2430 were relieved, 267 were unrelieved, 233 died, and 211 remained in hospital at Dec. 31st, 1915. In addition to these, 15,250 received advice and treatment in the various out-patient departments, giving a total of 18,391 for the year, the in-patients being 101 fewer and the out-patients 36 more than in the previous year. The average number of days for each patient in hospital was 25. The average daily number of in-patients was 217. The ordinary expenditure was less by £460 than in 1914. This decrease was largely attributable to a decrease on surgical, dispensary, and domestic expenses, which more than counterbalanced the increased cost of provisions. The average cost per occupied bed, based upon the total ordinary expenditure, less the cost of out-patients, reckoned at 1*s.* each, was £67 19*s.* 7*d.*, and of each in-patient treated £4 13*s.* 11*d.* A welcome addition to the endowment fund during the year was the gift of securities bringing in £373 per annum by Sir Alexander McRobert, of Cawnpore, and

among other sums towards the deficit on the accounts of 1914 a sum of over £1278 has been received as the proceeds of a gala-day held in Aberdeen. No change has taken place during the year in the honorary medical and surgical staff, all the members of which are now on military service. Those of them who are in Aberdeen are still able to devote part of their time to the work of the hospital. During the year 231 patients were treated in the convalescent hospital. The average number of patients in the hospital daily was 21, and the average length of stay was 33 days. The income was £552 in round figures and the expenditure was £798. The report for the Aberdeen Royal Asylum states that in consequence of the great advance in the cost of commodities of all kinds the rate for pauper patients was fixed at £38 2*s.*, inclusive of clothing, for the year, from May 15th, 1915, being an increase of £6 2*s.* over the previous rate, which has been in force since 1892. The minimum rate for private patients has also been raised from £30 to £36 per annum, exclusive of clothing and other extras. The directors fear that if prices continue to rise a further increase in the rates will be necessary.

THE Oxford Ophthalmological Congress will assemble at Keble College, Oxford, on the evening of Wednesday, July 12th, and the meeting will be held on Thursday and Friday, 13th and 14th.

THE NIGHTINGALE MEMORIAL IN ST. PAUL'S CATHEDRAL.—On Feb. 14th the Queen unveiled the memorial to Florence Nightingale, which has been placed in the crypt of St. Paul's Cathedral. The memorial represents the Lady of the Lamp holding a cup to the lips of a wounded soldier, and has been carved on white marble in low relief by Mr. Arthur G. Walker, who also executed the fine statue erected some months ago in Waterloo-place. Above the plaque, which is enclosed in an alabaster frame, are the words: "Blessed are the merciful," and below, "Florence Nightingale, O.M. Born May 12th, 1820. Died August 13th, 1910."

UNION OF MEDICAL PRACTITIONERS (LEICESTER SUB-DIVISION) AND LEICESTER PUBLIC MEDICAL SERVICE.—The annual meeting of this union was held on Feb. 11th. It will be remembered that Leicester adopted a comprehensive scheme including practically the whole of the medical profession in the district, of whom about three-fourths are on the panel for State-insured persons and are "acting members" of the Public Medical Service. This strong position has enabled the union to take uniform action in the interests of medical men, especially in the directions of effecting insurances and of collecting debts. The union has recently devoted much consideration to arrangements for giving medical attendance to patients of doctors engaged on military service, and a scheme as follows was adopted by the annual meeting, and will come into force on Feb. 21st:—

> During their own doctor's absence, private patients shall go to the doctor of their choice, who shall send out the account, collect the money, and return half of the fees to the doctor on service whose patients they are. Nearly 40 doctors in Leicester have expressed their willingness to accept contract patients of doctors who are away on the following conditions. A distributer has been appointed, with power to arrange for sub-distributers. State-insured and other contract patients requiring medical attendance will be given a card of authorisation by the distributer (who will retain a counterfoil) to take to a doctor who has consented to do this work. If he accepts the patient he affixes a gummed slip, bearing his name, address, and consulting hours, to the patient's medical ticket or Public Medical Service card and retains the authorisation card. If the doctor cannot accept the patient he returns the authorisation card and refers the patient again to the distributer. Patients accepted will remain under the care of the doctor accepting them until the end of 1916, if the war does not end before. When any doctor has accepted such as number as he deems sufficient he will notify the distributer to that effect. Payment to be made at an agreed *per capita* rate for all persons requiring medical treatment and accepted by a doctor.

Notwithstanding the war, the year just ended has been a very successful one for the Leicester Public Medical Service. The subscribers (chiefly women and children) numbered about 43,500. The principal Friendly Societies have their own dispensaries, and pay certain rates per annum to the Public Medical Service for attendance on their uninsured members and their wives and children (who are included in the above total of 43,500), and in addition for about 12,000 of their members who are State-insured. About 1100 dependants of sailors and soldiers were, by an arrangement with the War Relief Committee, given medical treatment through the service, at no initial cost to themselves. The number of school cases treated was: vision, 508; nose, ear, and throat, 437; teeth, 699. By arrangement with the guardians the necessary medicines for the outdoor sick poor of Leicester were dispensed by the Public Medical Service. The sum collected from subscribers to the service was £8558. Payments made by the Friendly Societies, and sums received from guardians and other sources, increased the total income for the year to considerably more than £15,000. After defraying the necessary establishment charges, the sum of £11,430 was distributed amongst the medical officers and specialists for attendance on subscribers. The following balances to the credit of the service were brought forward to the current year: general account, £243; furniture and renovation fund, £145; guarantee fund, £367.

ROYAL MATERNITY CHARITY OF LONDON.—The object of this charity is to provide midwives and medical attendance gratis to poor married women in their own homes who do not receive the maternity benefit under the Insurance Act. The statistical report for the year 1915, which has just been issued, is a record of needful work. The number of cases attended was 1045 and the number of infants born 1066, of whom 540 were males and 526 females. There were 21 cases of twins, stillbirths numbered 36, and the age of the mothers varied from 18 to 45. Out of 1045 cases attended by the midwives only one death is reported, that being a case of puerperal eclampsia. It is interesting to note that 665 wives of soldiers and sailors have been helped by the charity after their cases had been inquired into. Donations and subscriptions should be sent to the offices of the Royal Maternity Charity, 31, Finsbury-square, E.C.

PRESENTATION TO A MEDICAL MAN.—At the Castle, Exeter, recently, at the distribution of certificates to members of the Devon 1 Men's Voluntary Aid Detachment, Sir E. C. Wills, the High Sheriff, presented Dr. Arthur Laurence Candler with the certificate of life membership of the Red Cross Society in recognition of his services to the Voluntary Aid Detachment work in Devonshire. Miss Buller, on behalf of the officers and men of the "Devon 1," presented Dr. Candler with an address bearing the signatures of all the members, and a case of surgical instruments in appreciation of his services as honorary lecturer.

THE LATE MR. H. G. SHORTER.—One of the best known of the medical men of Hastings in his day, Mr. Henry Goldsworthy Shorter, died there on Feb. 4th at the age of 73. He had retired from practice for some time, but for many years was police-surgeon for the borough, and besides holding other appointments had a large private practice. Studying at Guy's Hospital he became M.R.C.S. in 1867, and took the L.S.A. diploma in the following year. From 1869 to 1871 he was a surgeon in the service of the P. and O. Co., and went many voyages to India and China. He finally settled at Hastings.

POOR-LAW MEDICAL OFFICERS' ASSOCIATION OF ENGLAND AND WALES.—At a recent meeting of the council of this association the honorary secretary reported that he had received a letter from Dr. A. Cox, medical secretary of the British Medical Association, who said that the memorandum of the Poor-law Medical Officers' Association had been considered and approved, and that he had written to the secretary of the Departmental Committee of the Local Government Board intimating that it would be supported by his Association. Various letters had been received from country members complaining of the increased cost of drugs and the difficulty experienced in getting boards of guardians to make extra payments to meet this expense, which was becoming very serious. Some had urged that as the guardians were bound to pay for "expensive medicines," many of the drugs in common use might reasonably be considered to come under this category, and they were bound to defray their cost. The honorary secretary said this was quite true. Under date April 12th, 1865, a circular had been issued by the Local Government Board imposing this duty on all boards of guardians in England and Wales. The council thought that this matter should be further considered. Another member had written, pointing out that the guardians were paying him a single salary for two Poor-law appointments. He was both a district medical officer and workhouse medical officer, but his board regarded

the appointments as conjoint. The honorary secretary said that this was quite illegal. Under the Poor-law Orders the appointments were regarded as separate, and it would be interesting to know how the board of guardians had ever been permitted to make the arrangement complained of. The council were of opinion that the Local Government Board should be approached and inquiries made. It was very important that the two appointments should be kept distinct. It might often happen that a practitioner holding both might desire to resign one and retain the other. Under the arrangement complained of this might be impossible. There was some discussion on the proposed federation of sectional Poor-law associations, as a meeting is shortly to be held at Norfolk House, Strand, which will be attended by delegates from such associations, and the representatives of Poor-law medical officers desire to be instructed as to how they should vote. After some discussion it was decided to adhere to the resolution passed at the last council meeting, that in the opinion of the association the matter ought to be deferred till after the war.

THE LATE DR. GUY BEATTY.—The death occurred on Feb. 7th, in a nursing home in Belfast, of Dr. Guy Beatty, a native of Tempo, co. Fermanagh. A son of a Newry man, he studied in Edinburgh and graduated M.B. of the university there in 1894. He served in the South African War, being civil surgeon of the South African Field Force, and for the past eight years he was in the West African Medical Service. On the outbreak of the present war he was directed to proceed to the Cameroons, where he served during the military operations there until August last, when he was invalided home.

ROYAL MEDICAL BENEVOLENT FUND GUILD.—The annual general meeting of the guild will be held on Monday, Feb. 21st, at 3.30 o'clock, at the Mansion House, the Lord Mayor of London having consented to preside. The speakers will include Sir Arthur May (Director-General of the Navy), Sir John Tweedy, Mrs. Scharlieb, M.D., and Dr. Louisa Garrett-Anderson.

PAYING PATIENTS AT THE BRIDGWATER (SOMERSET) HOSPITAL.—At a special meeting of the subscribers of the Bridgwater Hospital it was resolved:—

That patients should be admitted to the public wards by any medical man in the town and districts, subject to the approval of the committee, on the medical man's recommendation, at a minimum charge of 30*s.* weekly and to the private ward for £2 2*s.* weekly, and may be attended by his own medical man or one of the honorary staff on paying his usual or arranged fees for such attendance.

THE LATE DR. G. H. CHARLESWORTH, J.P.—Dr. George Henry Charlesworth, who died recently at his residence at Putney, was 57 years of age. He studied medicine at Charing Cross and King's College Hospitals, qualifying in 1884, and two years later becoming a Member of the Royal College of Surgeons of England. He was also a medical graduate of Brussels and held the diploma of Public Health of the English Conjoint Board. Dr. Charlesworth was a district medical officer of the London County Council and honorary consulting medical officer to the Wandsworth Provident Dispensary.

THE BATHS OF BATH.—Field Marshal Viscount French will open the reconstructed Royal suite of baths at Bath on Wednesday next, Feb. 23rd.

Mr. James Albert Bright, M.R.C.S., L.S.A., who died last week at Norwood, formerly held the office of mayor of Glastonbury for three years.

BOOKS, ETC., RECEIVED.

ADLARD AND SON, Bartholomew Press, E.C.
The City of Din: A Tirade against Noise. By Dan McKenzie, M.D. Glasg., F.R.C.S. Edin. Price 3*s.* 6*d.* net.

BAILLIÈRE, TINDALL, AND COX, London.
A Manual of Surgical Anæsthesia. By Bellamy Gardner, M.R.C.S., L.R.C.P. Lond. Second edition. Price 7*s.* 6*d.* net.
Sleeping Sickness: A Record of Four Years War against the Island of Principe. By B. E. Bruto da Costa and others. Translated by J. A. Wyllie, F.R.G.S., Lieutenant-Colonel, Indian Army (retd.). Price 7*s.* 6*d.* net.

CHURCHILL, J. AND A., London.
A Code of Rules for the Prevention of Infectious Diseases in Schools. Issued by the Medical Officers of Schools Association. Seventh edition. Price 1*s.* net.

LAURIE, T. WERNER, London.
The Soul of a Crown Prince. By T. W. H. Crosland. Price 1*s.* net.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

ALLAN, E., L.R.C.P. & S. Edin., L.F.P.S. Glasg., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Barrow-in-Furness District of the county of Lancaster.
ANWYL-DAVIES, T., M.R.C.S., L.R.C.P. Lond., has been appointed Casualty Officer and Resident Anæsthetist at St. Thomas's Hospital.
ARMSTRONG, HUBERT, M.D. Vict. and Liverp., Captain, R.A.M.C. (T.), has been appointed Honorary Physician to the Liverpool Infirmary for Children.
BHATIA, S. L., M.R.C.S., L.R.C.P. Lond., has been appointed Casualty Officer and Resident Anæsthetist at St. Thomas's Hospital.
BLUETT, D. C., has been appointed Casualty Officer at St. Thomas's Hospital.
BRADLEY, F., M.B., Ch.B. N.U.I., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Fintona District of the county of Tyrone.
CELESTIN, L. A., has been appointed Casualty Officer at St. Thomas's Hospital.
DAVIES, L. M., M.R.C.S., L.R.C.P. Lond., has been appointed Casualty Officer and Resident Anæsthetist at St. Thomas's Hospital.
HARRIS, J. C. N., has been appointed Resident House Surgeon at St. Thomas's Hospital.
HENSLEY, E. H. V., has been appointed Resident House Surgeon at St. Thomas's Hospital.
HIGGINS, F. E., M.R.C.S., L.R.C.P. Lond., has been appointed Senior House Physician at St. Thomas's Hospital.
HYMAN, O. H., has been appointed Resident House Surgeon at St. Thomas's Hospital.
LOVE, R. J., L.R.C.P. & S. Edin., L.R.F.P.S Glasg., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Staplehurst District of the county of Kent.
MARRIOTT, W., has been appointed Resident House Physician at St. Thomas's Hospital.
NAIRNE, N. S., has been appointed Ophthalmic House Surgeon at St. Thomas's Hospital.
ODDY, H. M., M.B., B.Ch. Oxon., M.R.C.S., L.R.C.P. Lond., has been appointed Resident House Physician at St. Thomas's Hospital.
PHILLIPS, P. R. O'R., M.R.C.S., L.R.C.P. Lond., has been appointed Casualty Officer and Resident Anæsthetist at St. Thomas's Hospital.
ROMANIS, W. H. C., M.B., B.C. Cantab., F.R.C.S. Eng., has been appointed House Surgeon and Resident Anæsthetist at St. Thomas's Hospital.
SMITH, J. FOREST, has been appointed Resident House Physician at St. Thomas's Hospital.
STORMER, H. G., has been appointed Resident House Surgeon at St. Thomas's Hospital.
VEY, F. H., has been appointed Resident House Physician at St. Thomas's Hospital.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

ABERGAVENNY, MONMOUTH COUNTY ASYLUM.—Temporary Assistant Medical Officer. Salary £7 7*s.* per week, with board, apartments, and attendance.
BRIDGWATER HOSPITAL.—House Surgeon, unmarried. Salary at rate of £125 per annum, with board, lodging, and washing.
BRISTOL ROYAL INFIRMARY.—House Physicians and House Surgeons. Salary at rate of £120 per annum, with board, apartments, and laundry.
CAMBRIDGESHIRE ASYLUM, Fulbourn, near Cambridge.—Junior Assistant Medical Officer, unmarried. Salary £200 per annum, with board, lodging, washing, and attendance.
CHARING CROSS HOSPITAL.—Medical and Surgical Registrar.
COVENTRY AND WARWICKSHIRE HOSPITAL, Coventry.—Third Resident. Salary £175 per annum, with rooms, board, laundry, and attendance.
EVELINA HOSPITAL FOR SICK CHILDREN, Southwark, S.E.—House Physician and House Surgeon. Salary at rate of £160 per annum, with board, residence, and washing.
GLASGOW, ROYAL HOSPITAL FOR SICK CHILDREN.—Temporary Medical Superintendent or Senior Resident Medical Officer. Also Resident House Physician and Two Resident House Surgeons for six months. Each with salary, board, and laundry.
GREENWICH UNION INFIRMARY AND WORKHOUSE.—Assistant Medical Officer, unmarried. Salary £175 per annum, with apartments, rations, and washing.
GUILDFORD, ROYAL SURREY COUNTY HOSPITAL.—House Surgeon. Salary £150 per annum, with board, residence, and laundry.
HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, Haverstock Hill, N.W.—Three Anæsthetists. Salary £25 per annum.
HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.—Second Anæsthetist.
HUDDERSFIELD ROYAL INFIRMARY.—Junior House Surgeon. Salary £100 per annum, with board, residence, and laundry.
LEEDS PUBLIC DISPENSARY.—Female Resident Medical Officer. Salary £130 per annum, with board, residence, and laundry.
MANCHESTER, BAGULEY SANATORIUM FOR TREATMENT OF TUBERCULOSIS.—Second Assistant Medical Officer, unmarried. Salary £250 per annum, with board and residence.
MANCHESTER, HULME DISPENSARY, Dale-street, Stretford-road.—House Surgeon. Salary £250 per annum, with apartments, attendance, coal, and gas.

NEW HOSPITAL FOR WOMEN, Euston-road, N.W.—Female Assistant Anæsthetists.

PORTSMOUTH ROYAL HOSPITAL.—Two Female House Surgeons for six months. Salary £150 per annum, with residence, board, &c.

QUEEN CHARLOTTE'S LYING IN HOSPITAL, Marylebone-road, N.W.—Assistant Resident Medical Officer (female) for four months. Salary at the rate of £60 per annum.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Surgeons for six months. Salary £100 per annum, with board, residence, and washing.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, S.E.—House Surgeon. Salary at rate of £150 per annum, with board and residence.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.—Radiographer and Medical Electrician. Salary £100 per annum.

ST. PETER'S HOSPITAL FOR STONE, &c., Henrietta-street, Covent Garden, W.C.—Junior House Surgeon for six months. Salary at rate of £75 per annum, with board, lodging, and washing.

SALFORD POOR-LAW UNION INFIRMARY.—Resident Assistant Medical Officer, unmarried. Salary £300 per annum, with apartments, attendance, and rations.

SALFORD ROYAL HOSPITAL.—House Physician and House Surgeon. Salary at rate of £250 and £200 per annum respectively, with board and residence.

SAMARITAN FREE HOSPITAL, Marylebone-road, N.W.—Honorary Dental Surgeon.

SHEFFIELD ROYAL INFIRMARY.—House Surgeon. Salary £100 per annum, with board and residence.

WEST BROMWICH AND DISTRICT HOSPITAL.—Assistant House Surgeon, unmarried. Salary £120 per annum, with residence, board, and laundry.

WESTERN GENERAL DISPENSARY, Marylebone-road, N.W.—Resident House Surgeon.

WEST HAM AND EASTERN GENERAL HOSPITAL.—House Physician and House Surgeon.

WOLVERHAMPTON AND MIDLAND COUNTIES EYE INFIRMARY.—House Surgeon. Salary £150 per annum, with apartments, board, and laundry.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Bangor, in the county of Carnarvon; and at Abercrave, in the county of Brecon.

Births, Marriages, and Deaths.

BIRTHS.

BAKER.—On Feb. 13th, at Torfield House, Hastings, Sussex, the wife of Dr. A. E. Baker, of a daughter.

FRASER.—On Feb. 12th, at Shooter's Hill-road, Blackheath, to Dr. and Mrs. A. Fraser, a son.

LEDINGHAM.—On Feb. 13th, at Yeoveney, Links-road, Epsom, the wife of Lieutenant-Colonel J. C. G. Ledingham, R.A.M.C., of a son.

MOORHEAD.—On Feb. 7th, at South Godstone, Surrey, the wife of B. L. Moorhead, M.B., C.M. Edin., of a son.

PLATTS.—On Feb. 12th, at East Sheen-avenue, S.W., to the wife of Sydney Goodman Platts, M.B. Cantab., a daughter.

SUTTON.—On Feb. 12th, at Clarendon-road, Southsea, the wife of Captain B. A. Sutton, R.A.M.C., of a son (stillborn).

WOOLLATT.—On Feb. 7th, at High Oak Lodge, Ware, the wife of P. C. Woollatt, M.D. Brux., Temporary Surgeon, Royal Navy, of a daughter.

MARRIAGES.

BROWNING—ASHLEY SMITH.—On Feb. 3rd, at St. George's, Hart-street, London, Harold Gordon Browning, M.B., B.Ch. Birm., of Pershore, Worcestershire, to Violet, elder adopted daughter of Dr. and Mrs. Ashley Smith, of Codsall, Staffordshire.

PASCO—ROBY.—On Feb. 12th, at St. Matthew's Church, Upper Clapton, Bernard Charles William Pasco, M.R.C.S., L.R.C.P. (Lieutenant, R.A.M.C.), to Annie, daughter of Mr. and Mrs. George W. Roby, of Stamford-hill, N.

PEARSON—EARL.—On Feb. 14th, at St. Augustine's, Norwich, Dr. S. V. Pearson, of Mundesley, to May Elizabeth, youngest daughter of Mr. and Mrs. Earl, of Norwich.

TURNBULL—BAKER.—On Feb. 12th, at St. Mary Abbot's, Kensington, Hubert Maitland Turnbull, D.M., Director of the Pathological Institute of the London Hospital, to Catherine Nairne Arnold, younger daughter of Mr. and Mrs. Frederick Arnold Baker.

DEATHS.

ALEXANDER.—On Feb. 14th, at Blackwall Lodge, Halifax, Reginald Gervase Alexander, M.D. Edin., J.P., in his 69th year.

LAKIN.—On Feb. 10th, at Leicester, Charles Lakin, L.R.C.P. Edin., aged 67 years.

MONCKTON.—On Feb. 4th, at East Sheen, William Monckton, M.R.C.S., L.R.C.P. Edin., late of Portishead, Somerset, and Rugeley, Staffordshire.

SAUNDERS.—On Feb. 11th, at Staines Lodge, Staines, Frederick Herbert Saunders, M.D. Edin, &c., aged 67 years.

STOKES.—On Feb. 10th, at Latchmere, Ham, suddenly, as the result of shell shock in France, Lieutenant-Colonel John Wilfred Stokes, R.A.M.C. (T.F.), 3rd West Riding Field Ambulance, aged 43 years.

TURNER.—On Feb. 15th, 1916, at 6, Eton-terrace, Edinburgh, after a short illness, Sir William Turner, K.C.B., F.R.S., Principal and Vice-Chancellor of the University of Edinburgh, in his 85th year. (No flowers by special request.)

WILLIAMS.—On Feb. 12th, at Oswestry, T. Hammond Williams, L.R.C.P. Edin., L.F.P.S. Glasg., aged 56 years.

WRIGHT.—On Jan. 31st, at Haddenham, Frederick William Wright, M.R.C.S., L.S.A. Lond., aged 75 years.

N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

VITAL STATISTICS, PUBLIC HEALTH, AND CLIMATE OF UGANDA.

ACCORDING to the Blue-book of Uganda the population of the Protectorate in March, 1915, was estimated at a total of 2,927,494. In this total are included 903 Europeans, of whom 269 are females, and 3560 Asiatics, comprising 2859 males and 701 females. The native population in those areas where reliable estimates are obtainable has been returned at 1,267,771 males and 1,505,260 females, while that in the unadministered regions of the Northern and Eastern Provinces is estimated at a further approximate figure of 150,000. Complete statistics of native births and deaths are not available throughout the Protectorate, but returns rendered by native chiefs from administered areas, comprising almost half the Protectorate, show that 33,100 births were registered during the year 1914 in the proportion of 23·4 per 1000 of living persons in the districts concerned. The registered deaths in the same area numbered 29,697, or 20·5 per 1000 of its population. In comparison with 1913 the birth-rate shows a decrease of 1·53 per mille and the death-rate a decrease of 1·91 per mille. 2160 native marriages were contracted during the year from a total, estimated by the Census of 1911, of approximately 431,301 adherents to Christianity. Returns from Government hospitals and dispensaries show a decrease in the number of cases treated from 112,624 to 90,730. The reduced total is due to the transfer of ten medical officers and six members of the subordinate staff from the medical and sanitary services of the Protectorate to military employment and to the consequent performance of routine duties by a skeleton staff.

The health of the European officials has been satisfactory. The total number resident during the year was 298, amongst whom there were 3 deaths and 582 cases of illness. Of the 582 cases, 381 were placed off duty for treatment; of the admissions to hospital, 186 were due to malaria and 6 to blackwater fever. The general European population, inclusive of officials, was 903. The principal diseases occurring among them were malaria, blackwater fever, enteric, and diseases of the digestive system.

An epidemic of enteric fever, which assumed for a time alarming features, occurred towards the end of 1914. There is evidence to show that this was introduced from East Africa, the initial cases occurring among travellers on the lake steamers from that Protectorate, who developed the disease in a few days after crossing Lake Victoria. There were 21 cases in all, but the epidemic declined rapidly.

The diseases of natives which call for special attention are plague, sleeping sickness, spirillum fever, leprosy, small-pox, and venereal diseases. Plague prevails mainly in the Eastern Province, although cases have occurred in the Buganda Province and in the districts west of the Nile. The disease has spread in the Lango district of the Eastern Province, but its incidence elsewhere, where organisation for its prevention is in force, has diminished. The work of native inspectors appointed to control the disease and to prevent its concealment has been satisfactory, and rewards offered for the destruction of rats produced in one district surprising results. The diminution of the number of cases of sleeping sickness continues satisfactory and is believed to be general. The discovery of a new species of trypanosome in the cattle of Bunyoro gave rise to apprehension of the possibility of its transmission to human beings. The supposition was based on its morphological resemblance to a trypanosome pathogenic to man in Rhodesia, but research has resulted in the opinion that the fear was groundless, and proposals for costly measures, which had been contemplated, to eradicate Glossina morsitans, the carrier of this parasite, were abandoned. The case incidence of spirillum fever has decreased materially with improved preventive measures adopted against the spirillum tick. Leprosy is scattered over the Protectorate. Attempts have been made from time to time to segregate lepers in special settlements under supervision of local chiefs but have proved unsatisfactory, and later efforts to segregate them in the villages have achieved little success. Lack of funds in the meantime hinders any comprehensive scheme of segregation, but there is no reason to suppose that the disease is increasing. Several local outbreaks of small-pox occurred, in particular in the Eastern Province, where the disease became epidemic towards the end of the year. The number of vaccinations effected was 13,687.

The climate varies considerably in different areas of the Protectorate. In the Nile Valley, 2000 feet above sea-level,

the conditions are tropical and more unhealthy than in the higher-lying lands between Lake Victoria and Lake Albert. The most pleasant climate in Uganda is found in the vicinity of Lake Victoria and in the districts of the Western Province, where the altitude exceeds 5000 feet above the sea in certain areas and where conditions of living approach those of the temperate zones. The average rainfall for the calendar year 1914 at 32 recording stations where regular observations were taken was 52·76 inches. Two yearly rainy seasons occur throughout the Protectorate, but without great regularity as to incidence or duration. The heavy rains fall between April and the middle of June, a more protracted period occurring between September and mid-December. Local variation of these wet seasons is considerable, and marked differences in rainfall are met with in places closely adjacent to each other.

A NEW ANTISEPTIC.

ATTENTION has been directed recently to the value of para-toluene-sodium-sulpho-chloramide as an antiseptic by the publication of the results of investigations as to its use for infected wounds, &c. The new antiseptic has been very promptly prepared by Messrs. Burroughs, Wellcome, and Co., and compressed products issued in two strengths—8·75 and 87·5 grains. Chloramine-T was at first suggested as a convenient short name for this antiseptic, but as the word chloramine has for a number of years been used for a combination of other medicinal agents Messrs. Burroughs, Wellcome, and Co. have decided to issue para-toluene-sodium-sulpho-chloramide under the distinguishing name "Tolamine." The strengths in which it is usually employed range from 0·5 per cent. up to 4 per cent. solutions, the stronger being used for irrigating infected wounds. "Soloid" tolamine is prepared at the Wellcome Chemical Works, Dartford, and supplied in the gr. 8·75 strength in bottles of 100, and in the gr. 87·5 strength in tubes of 10.

THE HISTORY OF CLINICAL THERMOMETRY.

Dr. John Haddon (Hawick) writes:—Those who are alive to tell of the earliest experience with the clinical thermometer must be few in number. During the session 1867-68 I acted as resident physician in the Edinburgh University clinical wards under Professors Bennett, Laycock, and Maclagan, and worked with the thermometer and the sphygmograph, taking observations which formed the subject of an M.D. thesis. Some years before Dr. Gould had taken the thermometer as the subject of his thesis, and I believe he also received a gold medal. Dr. Baddeley was at the same time working with the thermometer in the fever wards, and we drew up a chart together on which our observations were recorded in diagrammatic form. Dr. Baddeley unfortunately died from typhus fever during that session. At that time typhus fever cases were treated in the clinical wards, where I caught the infection myself in 1865-66.

THE SIZE OF THE NEW ARMY.

To the Editor of THE LANCET.

SIR,—When we read in the newspapers that the British army is now 4,000,000 men, and remember that before the war it was about 805,000, we are a little at a loss for appreciating the comparison. The following method may help us to realise what this increase means. There are 810,697 words in the Bible, and we had about that number of soldiers. There are also 3,566,480 letters in the Bible, and we can now consider every letter as a soldier instead of every word as heretofore. Also, we may consider that the first letter of every three verses is a medical man in the R.A.M.C., for there are about 10,000 medical officers now (vide "Strength of the Royal Army Medical Corps," THE LANCET, Nov. 20th, 1915, p. 1167), and there are 31,173 verses in the Bible. To take a Bible and turn over its leaves and realise that every single letter is a soldier in our army produces an impressive feeling of what fighting means.

I am, Sir, yours faithfully,

Feb. 14th, 1916. ACCOUNTANT.

MEMORIAL TO THE LATE MISS KATHARINE MONK.

A MEMORIAL to the late Miss Katharine Monk is being arranged by a committee, of which Viscount Hambleden is chairman. Miss Monk, whose death occurred on Feb. 20th, 1915, was for 21 years sister matron of King's College Hospital, taking charge of the nursing when this was relinquished by the St. John's Sisterhood. She was thus the founder of the Nursing School of King's College Hospital and inspired its special characteristics. It is proposed to erect a memorial in the hospital, and, if funds permit, to form an endowment in connexion with the Nurses' Home or the Training School for Nurses. Donations should be sent to the Secretary, Monk Memorial Committee, King's College Hospital, Denmark Hill, S.E.

AN APPEAL TO SMOKERS.

AT the Home for Disabled Belgian Soldiers, 45, Courtfield-gardens, Kensington, S.W., one of the homes maintained by the Wounded Allies Relief Committee, many of the disabled men are turning out articles in poker-work, including boxes suitable for cards, counters, and trinkets. Gifts of cigar-boxes will be gratefully received, as their employment makes it possible to devote a larger share of the profits to the direct benefit of the workers.

Lieutenant, R.A.M.C.—The address of the Association for Moral and Social Hygiene is 19, Tothill-street, Westminster, S.W., and its official organ, *The Shield*, is issued quarterly.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.

THURSDAY.—Papers:—Mr. K. Pearson: Mathematical Contributions to the Theory of Evolution. XIX., Second Supplement to a Memoir on Skew Variation.—Mr. F. P. Burt and Mr. E. C. Edgar: The Relative Combining Volumes of Hydrogen and Oxygen (communicated by Prof. H. B. Dixon).—Mr. W. Mason: On Speed Effect and Recovery in Slow-speed Alternating Stress Tests (communicated by Prof. B. Hopkinson).

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Thursday, Feb. 24th.

NEUROLOGY (Hon. Secretaries—H. Campbell Thomson, C. M. Hinds Howell): at 8 P.M.

CLINICAL MEETING.

Members who desire to show cases are requested to communicate with Dr. C. M. Hinds Howell, 145, Harley-street, W.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY.—9 P.M., Lettsomian Lecture:—Major F. W. Mott: The Effects of High Explosives on the Central Nervous System. (Lecture II.)

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.

WEDNESDAY.—4.30 P.M., Miss H. B. Hanson: Serbia as seen by a Red Cross Worker.

HUNTERIAN SOCIETY, 1, Wimpole-street, W.

WEDNESDAY.—9 P.M., Demonstration:—Dr. R. D. Maxwell: Gynæcological Specimens. Discussion invited.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

Course of Lectures on the Anatomy of the Human Body, for First aid and Ambulance Students (open to all members of ambulance companies and first-aid classes):—

MONDAY, WEDNESDAY, AND FRIDAY.—5.30 P.M., Prof. A. Keith. 4 P.M. to 7 P.M., Exhibition of Anatomical Preparations and Specimens in the Theatre on lecture days, and between 10 A.M. and 5 P.M. in the Hall of the Museum on the following day.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Addison: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Addison: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. E. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. H. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.

TUESDAY.—6 P.M., Dr. K. Sibley: X Rays. High Frequency.

THE THROAT HOSPITAL, Golden square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

For further particulars of the above Lectures, &c., see Advertisement Pages.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index and Title-page to Vol. II. of 1915 were given in THE LANCET of Dec. 25th, 1915.

VOLUMES AND CASES.

VOLUMES for the second half of the year 1915 are now ready. Bound in cloth, gilt lettered, price 16*s*., carriage extra.

Cases for binding the half-year's numbers are now ready. Cloth, gilt lettered, price 2*s*., by post 2*s*. 4*d*.

To be obtained on application to the Manager, accompanied by remittance.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

THE COLONIAL AND FOREIGN EDITION (printed on thin paper) is published in time to catch the weekly Friday mails to all parts of the world.

ALTERATION OF INLAND SUBSCRIPTION RATES.

OWING to the alteration in the Inland Newspaper Postal rate, the postage on each copy of THE LANCET will in future be 1*d*., and sometimes 1½*d*.

The revised Inland Subscription rates are:—

One Year	£1	3	3
Six Months	0	13	8
Three Months	0	7	0

The rates for the Colonies and Abroad (thin paper edition) will be as usual:—

One Year	£1	5	0
Six Months	0	14	0
Three Months	0	7	0

Subscriptions (which may commence at any time) are payable in advance. Cheques and Post Office Orders (crossed "London County and Westminster Bank, Covent Garden Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C.

TO COLONIAL AND FOREIGN SUBSCRIBERS.

SUBSCRIBERS ABROAD ARE PARTICULARLY REQUESTED TO NOTE THE RATES OF SUBSCRIPTIONS GIVEN ABOVE.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the above rates, whatever be the weight of any of the copies so supplied.

NEWSPAPERS FOR NEUTRAL COUNTRIES.

THE Secretary of the War Office has issued the following order:—

The public are informed that on and after Saturday, November 6th, newspapers, magazines, books, and other printed publications (other than trade circulars) will not be sent forward to neutral European countries unless posted direct from the office of publishers or newsagents who have obtained permission from the War Office for this purpose. Persons desiring to send newspapers, &c., to neutral European countries should, therefore, give their orders for execution to publishers or newsagents who have obtained such permission.

The Publisher of THE LANCET has obtained the required permission of the War Office, and he will forward copies direct from the Office to any neutral country on receipt of instructions.

ADVERTISEMENT RATES.

Books and Publications ... ...
Official and General Announcements
Trade and Miscellaneous Advertisements and Situations Vacant ...
} Five lines and under ... 4*s*. 0*d*.

Every additional line, 6*d*.

Situations Wanted: First 30 words, 2*s*. 6*d*.
Per additional 8 words, 6*d*.

Quarter Page, £1 10*s*. Half a Page, £2 15*s*.
Entire Page, £5 5*s*.
Special terms for Position Pages.

Advertisements (to ensure insertion the same week) should be delivered at the Office not later than Wednesday, accompanied by a remittance.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)
THE LANCET Office, Feb. 16th, 1916.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks
Feb. 10	29·860	S.W.	...	72	46	32	35	36	Cloudy
,, 11	29·314	S.E.	0·25	51	45	36	41	42	Raining
,, 12	30·044	N.	0·15	76	46	38	37	38	Cloudy
,, 13	30·071	W.	0·02	81	53	38	40	42	Cloudy
,, 14	29·860	W.	0·30	76	51	42	45	47	Cloudy
,, 15	29·600	N.W.	0·35	79	53	34	36	37	Overcast
,, 16	29·210	W.	0·21	84	53	37	49	52	Raining

The following magazines, journals, &c., have been received:—Dublin Journal of Medical Science, Birmingham Medical Review, Albany Medical Annals, Medical Chronicle, British Journal of Children's Diseases, Dominion Medical Monthly, Cleveland Medical Journal, Maryland Medical Journal, Archives of Radiology and Electrotherapy, American Journal of Public Health, Annales de l'Institut Pasteur, Journal of Nervous and Mental Disease, New Zealand Medical Journal, Canadian Medical Association Journal, Middlesex Hospital Journal, Medical Journal of South Africa, New York Medical Times.

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